CANADIAN JOURNAL OF BOTANY

JOURNAL CANADIEN DE BOTANIQUE

VOLUME 63, 1985

Author Index / Index des auteurs

Aarssen, L.W.
Competitive relations among species from pastures of different ages
L.W. Aarssen and Roy Turkington 2319

Abadie, M.
Cytologie ultrastructurale de l'anthère de *Saxifraga*. I. Période d'initiation des précurseurs des sporopollénines au niveau des principaux types exiniques
Michel Hideux et Michel Abadie 97

Adams, W.T.
Allozyme and mating-system variation in balsam fir (*Abies balsamea*) across a continuous elevational transect
D.B. Neale and W.T. Adams 2448

Aiken, S.G.
Restricted taxonomic value of leaf sections in Canadian narrow-leaved *Festuca* (Poaceae)
S.G. Aiken, S.J. Darbyshire, and L.P. Lefkovitch 995

Aist, J.R.
Chlortetracycline and barley papilla formation: localization of calcium and alteration of the response induced by *Erysiphe graminis*
M.R. Marshall, M.G. Smart, J.R. Aist, and H.W. Israel 876

Mitosis in the rice blast fungus and its possible implications for pathogenic variability
K.V.S.R. Kameswar Row, J.R. Aist, and J.P. Crill 1129

Alabouvette, J.
Croissance des coenocytes provasculaires dans la racine de *Marsilea diffusa* (Marsiléales)
Jean Vallade et Josiane Alabouvette 301

Allan, P.M.E.
A comparison of the flagellar apparatus in *Phytophthora, Saprolegnia, Thraustochytrium*, and *Rhizidiomyces*
Donald J.S. Barr and Paula M.E. Allan 138

Allen, E.
Artificial inoculation of young seedlings of lodgepole pine with *Endocronartium harknessii*
E. Allen and Y. Hiratsuka 1168

Allen, F.H.E.
Morphology, element composition, and response to acids and oxidizing agents of the haustorial neckband of *Uromyces phaseoli* var. *vignae*
Michèle C. Heath and Frances H.E. Allen 463

Allen, T.F.H.
Will similar forests develop on similar sites?
Bruce McCune and T.F.H. Allen 367

Forest dynamics in the Bitterroot Canyons, Montana
Bruce McCune and T.F.H. Allen 377

Alosi, M.C.
The ultrastructure of dwarf mistletoe (*Arceuthobium* spp.) sinker cells in the region of the host secondary vasculature
M. Carol Alosi and Clyde L. Calvin 889

Ambrose, J.D.
Hop tree (*Ptelea trifoliata*) in Canada: population and reproductive biology of a rare species
John D. Ambrose, Peter G. Kevan, and Randy M. Gadawski 1928

Amiro, B.D.
Temporal changes in boreal forest tree canopy cover along a gradient of gamma radiation
B.D. Amiro and J.R. Dugle 15

Amundson, R.G.
Effects of O_3, SO_2, and acidic rain on mycorrhizal infection in northern red oak seedlings
P.B. Reich, A.W. Schoettle, H.F. Stroo, J. Troiano, and R.G. Amundson 2049

Anagnostakis, S.L.
Evaluation of the presence of double-stranded RNA in *Ceratocystis ulmi*
J.G. Hoch, S.M. Tavantzis, R.J. Campana, and S.L. Anagnostakis 297

Anazawa, T.
Electron microscopy of an endoparasitic fungus, *Gonimochaete pyriforme*, infecting nematodes
Masatoshi Saikawa and Takashi Anazawa 2326

Anderson, P.M.
Late Wisconsin and Holocene vegetational history of the Upper Koyukuk region, Brooks Range, AK
Mary E. Edwards, Patricia M. Anderson, Harriet L. Garfinkel, and Linda B. Brubaker 616

Anderson, R.J.
Morphological and taxonomic relationships among branched, ligulate members of the genus *Desmarestia* (Phaeophyceae, Desmarestiales), with particular reference to South African *D. firma*
Robert James Anderson 437

Antos, J.A.
Plant form, developmental plasticity, and survival following burial by volcanic tephra
Joseph A. Antos and Donald B. Zobel 2083

Upward movement of underground plant parts into deposits of tephra from Mount St. Helens
Joseph A. Antos and Donald B. Zobel 2091

Apostolakos, P.
Studies on the development of the air pores and air chambers of *Marchantia paleacea*. II. Ultrastructure of the initial aperture formation with particular reference to cortical microtubule organizing centres
P. Apostolakos and B. Galatis 744

Appel, D.N.
An extended range for oak wilt and *Ceratocystis fagacearum* compatibility types in the United States
D.N. Appel, C. Frost Drees, and J. Johnson 1325

Arnason, J.T.
The photosensitization of the plant pathogen *Fusarium culmorum* by phenylheptatriyne from *Bidens pilosa*
G. Bourque, J.T. Arnason, C. Madhosingh, and W. Orr 899

Ashmun, J.W.
Biomass allocation in *Aster acuminatus*: variation within and among populations over 5 years
Jeffrey W. Ashmun, Robert L. Brown, and Louis F. Pitelka 2035

Asselin, A.
Glycoproteins, enzymatic activities, and *b* proteins in intercellular fluid extracts from hypersensitive *Nicotiana* species infected with tobacco mosaic virus
JEAN-GUY PARENT, RICHARD HOGUE, and ALAIN ASSELIN **928**

Comparative study of two groups of *b* proteins (pathogenesis related) from the intercellular fluid of *Nicotiana* leaf tissue infected by tobacco mosaic virus
MARC G. FORTIN, JEAN-GUY PARENT, and ALAIN ASSELIN **932**

Light-influenced extracellular accumulation of *b* (pathogenesis-related) proteins in *Nicotiana* green tissue induced by various chemicals or prolonged floating on water
ALAIN ASSELIN, JEAN GRENIER, and FRANÇOIS CÔTÉ **1276**

Aston, M.J.
Aphid-induced changes in growth indices of three leguminous plants: unrestricted infestation
C.D.B. HAWKINS, M.J. ASTON, and M.I. WHITECROSS **2454**

Avalos, A.
Phytochrome enhances nitrate reductase activity in the lichen *Evernia prunastri*
A. AVALOS and C. VICENTE **1350**

Bååth, E.
Soil microfungi in an area polluted by heavy metals
ANDERS NORDGREN, ERLAND BÅÅTH, and BENGT SÖDERSTRÖM **448**

Babcock, C.E.
Canadian and some extralimital *Paraphaeosphaeria* species
R.A. SHOEMAKER and C.E. BABCOCK **1284**

Bacon, C.W.
The distribution and ultrastructure of the endophyte of toxic tall fescue
D.M. HINTON and C.W. BACON **36**

Bagyanarayana, G.
A new species of *Kuehneola* on *Gymnosporia montana* from India
G. BAGYANARAYANA and K. NIRANJAN RAO **762**

Bailey, L.G.
Relationships between *Hordeum bulbosum* L. subsp. *bulbosum* and *H. bulbosum* subsp. *nodosum* comb. et stat. nov.
BERNARD R. BAUM and L. GRANT BAILEY **735**

Bain, J.F.
Chromosome numbers in the aureoid *Senecio* complex (Asteraceae)
JOHN F. BAIN **539**

Flavonoid variation in the *Senecio streptanthifolius* complex
JOHN F. BAIN and K.E. DENFORD **1685**

Baker, K.F.
An aggressive vascular-inhabiting *Phoma (Phoma tracheiphila* f. sp. *chrysanthemi* nov. f. sp.) weakly pathogenic to chrysanthemum
KENNETH F. BAKER, LILY H. DAVIS, STEPHEN WILHELM, and WILLIAM C. SNYDER **1730**

Baker, K.K.
Association of epidermal lignification with nonhost resistance of cucurbits to fungi
RAYMOND HAMMERSCHMIDT, ALICE M. BONNEN, GARY C. BERGSTROM, and KAREN K. BAKER **2393**

Balangé, A.-P.
Induction de la synthèse de la δ-aminolévulinate déshydratase des cotylédons de radis étiolés ou cultivés sous lumière rouge lointain par l'érythromycine
CLAUDE HUAULT, PHILIPPE BRUYANT et ALAIN-PIERRE BALANGÉ **950**

Barabé, D.
Développement du fruit de *Prunus virginiana* (Rosaceae)
MICHEL LABRECQUE, DENIS BARABÉ et JOACHIM VIETH **242**

Anatomie florale de *Monstera deliciosa* (Araceae)
DENIS BARABÉ et LOUISE CHRÉTIEN **1423**

Barnes, B.V.
Characteristics and origin of a new birch species, *Betula murrayana*, from southeastern Michigan
BURTON V. BARNES and BRUCE P. DANCIK **223**

Occurrence of hybrids between bigtooth and trembling aspen in Michigan
BURTON V. BARNES and KURT S. PREGITZER **1888**

Barnes, W.J.
Population dynamics of woody plants on a river island
WILLIAM J. BARNES **647**

Barr, D.J.S.
A comparison of the flagellar apparatus in *Phytophthora, Saprolegnia, Thraustochytrium,* and *Rhizidiomyces*
DONALD J.S. BARR and PAULA M.E. ALLAN **138**

The ultrastructure of the zoospore of *Hyphochytrium catenoides*
ELIZABETH W. COONEY, DONALD J.S. BARR, and WILLIAM E. BARSTOW **497**

Barrasa, J.M.
Aphysiostroma, a new nonostiolate hypocrealean fungus
J.M. BARRASA, A.T. MARTÍNEZ, and G. MORENO **2439**

Barron, G.L.
Fungal parasites of bdelloid rotifers: *Diheterospora*
G.L. BARRON **211**

Barstow, W.E.
The ultrastructure of the zoospore of *Hyphochytrium catenoides*
ELIZABETH W. COONEY, DONALD J.S. BARR, and WILLIAM E. BARSTOW **497**

Bartsch, I.
A preliminary investigation of primary production and decomposition in four peatlands near Schefferville, Québec
I. BARTSCH and T.R. MOORE **1241**

Basinger, J.F.
Fossil flowers and leaves of the Ebenaceae from the Eocene of southern Australia
JAMES F. BASINGER and DAVID C. CHRISTOPHEL **1825**

Baskin, C.C.
Role of dispersal date and changes in physiological responses in controlling timing of germination in achenes of *Geum canadense*
JERRY M. BASKIN and CAROL C. BASKIN **1654**

Baskin, J.M.
Role of dispersal date and changes in physiological responses in controlling timing of germination in achenes of *Geum canadense*
JERRY M. BASKIN and CAROL C. BASKIN **1654**

Bauchop, T.
Mitosis and the phylogeny of the genus *Neocallimastix*
I. BRENT HEATH and TOM BAUCHOP **1595**

Baum, B.R.
Relationships between *Hordeum bulbosum* L. subsp. *bulbosum* and *H. bulbosum* subsp. *nodosum* comb. et stat. nov.
BERNARD R. BAUM and L. GRANT BAILEY **735**

Avena atlantica, a new diploid species of the oat genus from Morocco
BERNARD R. BAUM and GEORGE FEDAK **1057**

A new tetraploid species of *Avena* discovered in Morocco
BERNARD R. BAUM and GEORGE FEDAK **1379**

Beckett, A.
The anatomy of the mature perithecium in *Sordaria humana* and its significance for fungal multicellular development
N.D. READ and A. BECKETT **281**

Beckjord, P.R.
Effects of nitrogen and phosphorus fertilization on growth and formation of ectomycorrhizae of *Quercus alba* and *Q. rubra* seedlings by *Pisolithus tinctorius* and *Scleroderma auranteum*
PETER R. BECKJORD, JOHN H. MELHUISH, JR., and MARLA S. MCINTOSH **1677**

Benbadis, M.-C.
Effet stimulant de la poly-D-lysine sur l'entrée en mitose de cellules G_2 du méristème racinaire d'*Allium sativum*
M.-C. BENBADIS, M. DELAGE et G. DAOUSE **155**

Benhamou, N.
Use of monoclonal antibodies to detect a phytotoxic glycopeptide produced by *Ophiostoma ulmi*, the Dutch elm disease pathogen
NICOLE BENHAMOU, G.B. OUELLETTE, J.G. LAFONTAINE, and J.R. JOLY 1177

Ultrastructural localization in host tissues of a toxic glycopeptide produced by *Ophiostoma ulmi*, using monoclonal antibodies
NICOLE BENHAMOU, J.G. LAFONTAINE, J.R. JOLY, and G.B. OUELLETTE 1185

Bennett, J.P.
Growth response of two varieties of slash pine seedlings to chronic ozone exposures
W.E. HOGSETT, M. PLOCHER, V. WILDMAN, D.T. TINGEY, and J.P. BENNETT 2369

Ben-Ze'ev, I.S.
Entomophthora erupta and *Entomophthora helvetica* sp. nov. (Zygomycetes: Entomophthorales), two pathogens of Miridae (Heteroptera) distinguished by pathobiological and nuclear features
I.S. BEN-ZE'EV, S. KELLER, and A.B. EWEN 1469

Berg, B.
Temporal variation of litter decomposition in relation to simulated soil climate. Long-term decomposition in a Scots pine forest. V
P.-E. JANSSON and B. BERG 1008

Bergstrom, G.C.
Association of epidermal lignification with nonhost resistance of cucurbits to fungi
RAYMOND HAMMERSCHMIDT, ALICE M. BONNEN, GARY C. BERGSTROM, and KAREN K. BAKER 2393

Bernhardt, E.A.
A new *Papulaspora* species from the pondweeds *Potamogeton nodosus* and *P. crispus* in California
E.A. BERNHARDT and J.M. DUNIWAY 429

Bewley, J.D.
Seed development in *Ricinus communis* cv. Hale (castor bean). III. Pattern of storage protein and phytin accumulation in the endosperm
JOHN S. GREENWOOD and J. DEREK BEWLEY 2121

Desiccation of imbibed and germinating pea axes causes a partial reversal of germination events
LOUISE LALONDE and J. DEREK BEWLEY 2248

Biggs, A.R.
Formation of the primary protective layer and phellogen after leaf abscission in peach
A.R. BIGGS and J. NORTHOVER 1547

Billings, W.D.
Succession and biomass allocation as controlled by *Sphagnum* in an Alaskan peatland
J.O. LUKEN, W.D. BILLINGS, and K.M. PETERSON 1500

Bird, C.J.
Palmaria mollis stat. nov.: a newly recognized species of *Palmaria* (Rhodophyceae) from the northeast Pacific Ocean
JOHN P. VAN DER MEER and CAROLYN J. BIRD 398

Biswas, A.K.
Penicillin action stimulating growth and metabolism in seedlings of rice (*Oryza sativa*)
S. MUKHERJI and A.K. BISWAS 1150

Blanco, M.J.
Effect of an exogenous supply of urea on the content and secretion of soluble carbohydrates of *Evernia prunastri*
C. VICENTE and MARÍA JOSÉ BLANCO 1344

Bloebaum, P.
Salinity tolerance in *Spergularia marina*
JOHN M. CHEESEMAN, P. BLOEBAUM, CAROL ENKOJI, and LINDA K. WICKENS 1762

Boasson, R.
The effects of CO_2 and membranes on sporulation in axenic cultures of flax rust
ROSALINDA BOASSON and MICHAEL SHAW 1418

Effect of heat shock on protein synthesis in flax rust uredosporelings
MICHAEL SHAW, ROSALINDA BOASSON, and LEROY SCRUBB 2069

Boerner, R.E.J.
Foliar nutrient dynamics, growth, and nutrient use efficiency of *Hamamelis virginiana* in three forest microsites
RALPH E.J. BOERNER 1476

Bohm, B.A.
Chromosomal and flavonoid chemical confirmation of intergeneric hybridization between *Tolmiea* and *Tellima* (Saxifragaceae)
DOUGLAS E. SOLTIS and BRUCE A. BOHM 1309

Bohm, L.R.
Quantitative studies in early ovule development. I. Intraindividual variation in *Nothofagus antarctica*
R.K. SCAGEL, J. MAZE, L.R. BOHM, and N.L. VOGT 1769

Boileau, L.J.R.
Uranium accumulation in the lichen *Cladonia rangiferina*. Part I. Uptake of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. BOILEAU, E. NIEBOER, and D.H.S. RICHARDSON 384

Uranium accumulation in the lichen *Cladonia rangiferina*. Part II. Toxic effects of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. BOILEAU, E. NIEBOER, and D.H.S. RICHARDSON 390

Bond, J.J.
A new chytridiomycete parasitizing the tardigrade *Milnesium tardigradum*
RUTH ANN DEWEL, JERRY D. JOINES, and JOHN J. BOND 1525

Bonnen, A.M.
Association of epidermal lignification with nonhost resistance of cucurbits to fungi
RAYMOND HAMMERSCHMIDT, ALICE M. BONNEN, GARY C. BERGSTROM, and KAREN K. BAKER 2393

Bottacin, A.
Nitrogen absorption and assimilation in NaCl-resistant and NaCl-susceptible millet genotypes (*Pennisetum americanum*)
ALESSANDRA BOTTACIN, GIOVANNI CACCO, and MASSIMO SACCOMANI 517

Bourque, G.
The photosensitization of the plant pathogen *Fusarium culmorum* by phenylheptatriyne from *Bidens pilosa*
G. BOURQUE, J.T. ARNASON, C. MADHOSINGH, and W. ORR 899

Boutin, B.
Étude de la réactivation cambiale chez un arbre ayant un bois à zones poreuses (*Castanea sativa*) et deux autres au bois à pores diffus (*Betula verrucosa, Acer campestre*)
BERTILLE BOUTIN 1335

Brand, G.J.
Evaluating allometric shrub biomass equations fit to generated data
GARY J. BRAND and W. BRAD SMITH 64

Bray, D.
Anatomy and ultrastructure of the endophytic system of *Pilostyles thurberi* (Rafflesiaceae)
JOB KUIJT, D. BRAY, and A.R. OLSON 1231

Britton, D.M.
Triploidy and its evolutionary significance in *Cystopteris protrusa*
CHRISTOPHER H. HAUFLER, MICHAEL D. WINDHAM, DONALD M. BRITTON, and SCOTT J. ROBINSON 1855

Brookes, B.S.
Medicago lesinsii, a new Mediterranean species
ERNEST SMALL and BRENDA S. BROOKES 728

Brown, L.M.
Stepwise adaptation to salinity in the green alga *Nannochloris bacillaris*
LEWIS M. BROWN 327

Physiological ecology of the bloom-forming alga *Chrysochromulina breviturrita* (Prymnesiophyceae) from lakes influenced by acid precipitation
JOHN D. WEHR, LEWIS M. BROWN, and KATHRYN O'GRADY 2231

Brown, R.L.
Biomass allocation in *Aster acuminatus*: variation within and among populations over 5 years
JEFFREY W. ASHMUN, ROBERT L. BROWN, and LOUIS F. PITELKA 2035

Brubaker, L.B.
Late Wisconsin and Holocene vegetational history of the Upper Koyukuk region, Brooks Range, AK
MARY E. EDWARDS, PATRICIA M. ANDERSON, HARRIET L. GARFINKEL, and LINDA B. BRUBAKER 616

Bruck, D.K.
Incompetence of stem epidermal cells to dedifferentiate and graft
DAN B. WALKER and DAVID K. BRUCK 2129

Brundrett, M.C.
A developmental study of the early stages in vesicular–arbuscular mycorrhiza formation
M.C. BRUNDRETT, Y. PICHÉ, and R.L. PETERSON 184

Brunner, U.
Chemical and ultrastructural studies on the distribution of sporopolleninlike biopolymers in six genera of lichen phycobionts
UELI BRUNNER and ROSMARIE HONEGGER 2221

Bruyant, P.
Induction de la synthèse de la δ-aminolévulinate déshydratase des cotylédons de radis étiolés ou cultivés sous lumière rouge lointain par l'érythromycine
CLAUDE HUAULT, PHILIPPE BRUYANT et ALAIN-PIERRE BALANGÉ 950

Bugbee, W.M.
Enumeration, location, and characterization of endophytic bacteria within sugar beet roots
MARK J. JACOBS, WILLIAM M. BUGBEE, and DAVID A. GABRIELSON 1262

Bunnell, F.L.
Species composition and herbage production of mountain rangelands in northern British Columbia
DALE R. SEIP and FRED L. BUNNELL 2077

Busse, M.D.
Vesicular–arbuscular mycorrhizal (*Glomus fasciculatum*) influence on soybean drought tolerance in high phosphorus soil
M.D. BUSSE and J.R. ELLIS 2290

Buttleman, C.G.
Biomass and productivity of the woody strata of forested bogs in northern Minnesota
D.F. GRIGAL, C.G. BUTTLEMAN, and L.K. KERNIK 2416

Buxton, G.F.
Physiological responses of three northern conifers to rapid and slow induction of moisture stress
G.F. BUXTON, D.R. CYR, E.B. DUMBROFF, and D.P. WEBB 1171

Byng, G.S.
Glyphosate as a probe of the pentafunctional *arom* protein of *Euglena gracilis*
GRAHAM S. BYNG, ROBERT J. WHITAKER, and ROY A. JENSEN 1021

Cacco, G.
Nitrogen absorption and assimilation in NaCl-resistant and NaCl-susceptible millet genotypes (*Pennisetum americanum*)
ALESSANDRA BOTTACIN, GIOVANNI CACCO, and MASSIMO SACCOMANI 517

Caesar, J.C.
Germinability of *Leveillula taurica* (powdery mildew) conidia obtained from water-stressed pepper plants
J. CARTEY CAESAR and G.C. CLERK 1681

Calkin, H.W.
Xylem water potentials and hydraulic conductances in eight species of ferns
HOWARD W. CALKIN, ARTHUR C. GIBSON, and PARK S. NOBEL 632

Calvin, C.L.
The ultrastructure of dwarf mistletoe (*Arceuthobium* spp.) sinker cells in the region of the host secondary vasculature
M. CAROL ALOSI and CLYDE L. CALVIN 889

Camirand, A.
Are charged lipid-linked intermediates involved in the biosynthesis of β-glucans?
ANNE CAMIRAND, KRIKOR TOROSSIAN, TAKAHISA HAYASHI, and GORDON MACLACHLAN 867

Campana, R.J.
Evaluation of the presence of double-stranded RNA in *Ceratocystis ulmi*
J.G. HOCH, S.M. TAVANTZIS, R.J. CAMPANA, and S.L. ANAGNOSTAKIS 297

Campbell, R.N.
Longevity of *Olpidium brassicae* in air-dry soil and the persistence of the lettuce big-vein agent
R.N. CAMPBELL 2288

Campbell, T.A.
Growth analysis in common milkweed (*Asclepias syriaca*)
T.A. CAMPBELL 2345

Canvin, D.T.
Inorganic carbon accumulation and photosynthesis by *Chlorella pyrenoidosa*
BARRY J. SHELP and DAVID T. CANVIN 1249

Cass, D.D.
Megagametophyte development in *Hordeum vulgare*. 1. Early megagametogenesis and the nature of cell wall formation
D.D. CASS, D.J. PETEYA, and B.L. ROBERTSON 2164

Cavers, P.B.
A comparison of seedling vigour in crop and weed biotypes of proso millet (*Panicum miliaceum*)
DWAYNE R.J. MOORE and PAUL B. CAVERS 1659

Cayouette, J.
Chromosome studies on natural hybrids between maritime species of *Carex* (sections *Phacocystis* and *Cryptocarpae*) in northeastern North America, and their taxonomic implications
JACQUES CAYOUETTE and PIERRE MORISSET 1957

Chalamet, A.
Étude de l'influence des réserves azotées dans l'estimation par ^{15}N de la fixation symbiotique d'une plante pérenne, *Trifolium pratense*
CHANTAL LESCURE et ALAIN CHALAMET 991

Chapital, D.C.
Specific cotton leaf responses to wounding and treatment with cell-free extracts of *Aspergillus flavus*
H.J. ZERINGUE, JR., E.J. CONKERTON, and D.C. CHAPITAL 2470

Charest, P.J.
The influence of temperature on tumorigenesis induced by various strains of *Agrobacterium tumefaciens*
P.J. CHAREST and P. DION 1160

Cheeseman, J.M.
Salinity tolerance in *Spergularia marina*
JOHN M. CHEESEMAN, P. BLOEBAUM, CAROL ENKOJI, and LINDA K. WICKENS 1762

Chenou, E.
Ultrastructure de l'oosphère et du zygote du *Marsilea vestita* après un faible abaissement de température
MICHÈLE FERRAND, ELIANE CHENOU et JANINE KULIGOWSKI 859

Effets de faibles abaissements de température sur la différenciation de l'oosphère et sur les processus de fécondation chez le *Marsilea vestita* (Ptéridophytes)
ÉLIANE CHENOU, JANINE KULIGOWSKI et MICHÈLE FERRAND 1753

Chet, I.
Accumulation of ochratoxin A in sclerotia of *Aspergillus ochraceus*
N. PASTER, N. LISKER, and I. CHET 661

Chevalier, G.
Étude ultrastructural comparée des associations symbiotiques mycorhiziennes *Helianthemum salicifolium – Terfezia claveryi* et *Helianthemum salicifolium – Terfezia leptoderma*
JEAN DEXHEIMER, JOËLLE GERARD, JEAN-PIERRE LEDUC et GÉRARD CHEVALIER 582

Chlyah, H.
Divisions cellulaires au niveau de l'épiderme de l'hypocotyle du lin (*Linum usitatissimum*) cultivé *in vitro*
M. SQALLI et H. CHLYAH 1691

Chmielewski, J.G.
Cytogeographic studies on North American asters. II. *Virgulus ericoides* and *V. novae-angliae* in southern Ontario
JERRY G. CHMIELEWSKI and JOHN C. SEMPLE 1652

Chong, J.
Cytochemical studies on *Puccinia graminis* f. sp. *tritici* in a compatible wheat host. I. Walls of intercellular hyphal cells and haustorium mother cells
J. CHONG, D.E. HARDER, and R. ROHRINGER 1713

Chrétien, L.
Histogenèse et organogenèse de *Picea pungens* cultivé *in vitro*
LOUISE CHRÉTIEN et JOACHIM VIETH 1313

Anatomie florale de *Monstera deliciosa* (Araceae)
DENIS BARABÉ et LOUISE CHRÉTIEN 1423

Christophel, D.C.
Fossil flowers and leaves of the Ebenaceae from the Eocene of southern Australia
JAMES F. BASINGER and DAVID C. CHRISTOPHEL 1825

Churchill, A.C.L.
Heterokaryon formation *in planta* by genetically marked strains of *Tilletia caries*
A.C.L. CHURCHILL and DALLICE MILLS 1924

Clark, W.R.
Standing crop of *Sagittaria* in the Upper Mississippi River
WILLIAM R. CLARK and ROBERT T. CLAY 1453

Clay, R.T.
Standing crop of *Sagittaria* in the Upper Mississippi River
WILLIAM R. CLARK and ROBERT T. CLAY 1453

Clerk, G.C.
Germinability of *Leveillula taurica* (powdery mildew) conidia obtained from water-stressed pepper plants
J. CARTEY CAESAR and G.C. CLERK 1681

Cloutier, A.
Microdistribution des espèces végétales au pied des troncs d'*Acer saccharum* dans une érablière du sud du Québec
ANDRÉ CLOUTIER 274

Conkerton, E.J.
Specific cotton leaf responses to wounding and treatment with cell-free extracts of *Aspergillus flavus*
H.J. ZERINGUE, JR., E.J. CONKERTON, and D.C. CHAPITAL 2470

Constabel, F.
Laticifers and latex in fruits of periwinkle, *Catharanthus roseus*
U. EILERT, L.R. NESBITT, and F. CONSTABEL 1540

Cooke, T.J.
A geometric analysis of somatic embryo formation in carrot cell cultures
F. MARK SCHIAVONE and TODD J. COOKE 1573

Cooney, E.W.
The ultrastructure of the zoospore of *Hyphochytrium catenoides*
ELIZABETH W. COONEY, DONALD J.S. BARR, and WILLIAM E. BARSTOW 497

Côté, F.
Light-influenced extracellular accumulation of *b* (pathogenesis-related) proteins in *Nicotiana* green tissue induced by various chemicals or prolonged floating on water
ALAIN ASSELIN, JEAN GRENIER, and FRANÇOIS CÔTÉ 1276

Couillard, L.
Évolution holocène d'une tourbière à pergélisol (Québec nordique)
LINE COUILLARD et SERGE PAYETTE 1104

Crane, J.L.
A Costa Rican black mildew found in Everglades National Park, Florida
M.L. FARR, JEAN D. SCHOKNECHT, and J.L. CRANE 1983

Crane, P.R.
Growth and reproductive biology of *Joffrea speirsii* gen. et sp. nov., a *Cercidiphyllum*-like plant from the Late Paleocene of Alberta, Canada
PETER R. CRANE and RUTH A. STOCKEY 340

Crawford, R.C.
Pacific yew dominance in tall forests, a classification dilemma
REX C. CRAWFORD and FREDERIC D. JOHNSON 592

Crill, J.P.
Mitosis in the rice blast fungus and its possible implications for pathogenic variability
K.V.S.R. KAMESWAR ROW, J.R. AIST, and J.P. CRILL 1129

Cuguen, J.
Architecture des jeunes hêtres *Fagus sylvatica*
B. THIÉBAUT, J. CUGUEN et S. DUPRÉ 2100

Cumming, J.R.
Kinetics of potassium uptake in red spruce seedlings
J.R. CUMMING, R.T. ECKERT, and L.S. EVANS 512

Effect of aluminum on potassium uptake by red spruce seedlings
J.R. CUMMING, R.T. ECKERT, and L.S. EVANS 1099

Cyr, D.R.
Physiological responses of three northern conifers to rapid and slow induction of moisture stress
G.F. BUXTON, D.R. CYR, E.B. DUMBROFF, and D.P. WEBB 1171

Daguin, F.
Relations entre hypolignification et état vitreux chez *Salix babylonica* en culture *in vitro*. Rôle de la nutrition ammoniacale
F. DAGUIN et R. LETOUZE 324

Dale, M.
The effects of oil spill chemicals on transpiration, CO_2 exchange, and cuticular structure in *Salix interior*
J.S. GOUDEY, M. DALE, and J. HODDINOTT 2340

Dancik, B.P.
Monoterpene and morphological variation and hybridization of *Pinus contorta* and *P. banksiana* in Alberta
JOHN C. POLLACK and BRUCE P. DANCIK 201

Characteristics and origin of a new birch species, *Betula murrayana*, from southeastern Michigan
BURTON V. BARNES and BRUCE P. DANCIK 223

Daouse, G.
Effet stimulant de la poly-D-lysine sur l'entrée en mitose de cellules G_2 du méristème racinaire d'*Allium sativum*
M.-C. BENBADIS, M. DELAGE et G. DAOUSE 155

Darbyshire, S.J.
Restricted taxonomic value of leaf sections in Canadian narrow-leaved *Festuca* (Poaceae)
S.G. AIKEN, S.J. DARBYSHIRE, and L.P. LEFKOVITCH 995

David, A.
Greffage *in vitro* du pin maritime (*Pinus pinaster*)
H. TRANVAN et A. DAVID 1017

Davis, E.A.
Endomycorrhizal colonization of glasshouse-grown wheat as influenced by fertilizer salts when banded or soil-mixed
E. ANNE DAVIS and J.L. YOUNG 1196

Davis, L.H.
An aggressive vascular-inhabiting *Phoma (Phoma tracheiphila* f. sp. *chrysanthemi* nov. f. sp.) weakly pathogenic to chrysanthemum
KENNETH F. BAKER, LILY H. DAVIS, STEPHEN WILHELM, and WILLIAM C. SNYDER **1730**

deCatanzaro, J.B.
Changes in the weight and nutrient composition of litter fall in three forest ecosystem types on coastal British Columbia
J.B. DECATANZARO and J.P. KIMMINS **1046**

Delage, M.
Effet stimulant de la poly-D-lysine sur l'entrée en mitose de cellules G_2 du méristème racinaire d'*Allium sativum*
M.-C. BENBADIS, M. DELAGE et G. DAOUSE **155**

del Moral, R.
Competitive effects on the structure of subalpine meadow communities
ROGER DEL MORAL **1444**

DeMason, D.A.
The continuity of primary and secondary growth in *Cordyline terminalis* (Agavaceae)
DARLEEN A. DEMASON and MARK A. WILSON **1907**

Denford, K.E.
Flavonoid variation in the *Senecio streptanthifolius* complex
JOHN F. BAIN and K.E. DENFORD **1685**

Dennis, M.F.
An automated computer-controlled gas-exchange system for continual monitoring of physiological activities in plants
JOHN D. MAHON and MAUREEN F. DENNIS **2213**

Denny, S.K.
Breeding systems and genetic variation in *Amsinckia spectabilis* (Boraginaceae)
FRED R. GANDERS, SUSAN K. DENNY, and DAVID TSAI **533**

deNoyelles, F., Jr.
The species-specific effects of sublethal concentrations of cadmium on freshwater phytoplankton communities in a Canadian Shield lake
DANNY C. REINKE and FRANK DENOYELLES, JR. **1997**

Deschênes, J.
The influence of salinity on *Scirpus americanus* tidal marshes in the St. Lawrence River estuary, Québec
J. DESCHÊNES and J.-B. SÉRODES **920**

Dewel, R.A.
A new chytridiomycete parasitizing the tardigrade *Milnesium tardigradum*
RUTH ANN DEWEL, JERRY D. JOINES, and JOHN J. BOND **1525**

Dexheimer, J.
Étude ultrastructural comparée des associations symbiotiques mycorhiziennes *Helianthemum salicifolium – Terfezia claveryi* et *Helianthemum salicifolium – Terfezia leptoderma*
JEAN DEXHEIMER, JOËLLE GERARD, JEAN-PIERRE LEDUC et GÉRARD CHEVALIER **582**

Dion, P.
The influence of temperature on tumorigenesis induced by various strains of *Agrobacterium tumefaciens*
P.J. CHAREST and P. DION **1160**

Dirks, V.A.
Variation and climatic adaptation in northern populations of *Datura stramonium*
SUSAN E. WEAVER, VICTOR A. DIRKS, and SUZANNE I. WARWICK **1303**

Donèche, B.
Dégradation de l'acide malique par *Botrytis cinerea*
BERNARD DONÈCHE, FRANÇOISE ROUX et PASCAL RIBÉREAU-GAYON **1820**

Drees, C.F.
An extended range for oak wilt and *Ceratocystis fagacearum* compatibility types in the United States
D.N. APPEL, C. FROST DREES, and J. JOHNSON **1325**

Dubé, M.
Races chromosomiques chez *Festuca rubra sensu lato* (Poaceae) dans l'est du Québec
MARTIN DUBÉ, PIERRE MORISSET et JANOUK MURDOCK **227**

Duchesne, L.C.
Accumulation of phytoalexins in *Ulmus americana* in response to infection by a nonaggressive and an aggressive strain of *Ophiostoma ulmi*
L.C. DUCHESNE, R.S. JENG, and M. HUBBES **678**

Dugle, J.R.
Temporal changes in boreal forest tree canopy cover along a gradient of gamma radiation
B.D. AMIRO and J.R. DUGLE **15**

Leaf development and morphology in ash: influence of gamma radiation
JANET R. DUGLE and JANICE L. HAWKINS **1458**

Dumbroff, E.B.
Developmental studies of the stratification–germination process in sugar maple embryos
C.Y. SHIH, E.B. DUMBROFF, and CAROL A. PETERSON **903**

Physiological responses of three northern conifers to rapid and slow induction of moisture stress
G.F. BUXTON, D.R. CYR, E.B. DUMBROFF, and D.P. WEBB **1171**

Duniway, J.M.
A new *Papulaspora* species from the pondweeds *Potamogeton nodosus* and *P. crispus* in California
E.A. BERNHARDT and J.M. DUNIWAY **429**

Dupré, S.
Architecture des jeunes hêtres *Fagus sylvatica*
B. THIÉBAUT, J. CUGUEN et S. DUPRÉ **2100**

Durall, D.M.
Decomposition of timothy (*Phleum pratense*) litter on a reclaimed surface coal mine in Alberta, Canada
D.M. DURALL, W.F.J. PARSONS, and D. PARKINSON **1586**

Dwyer, L.M.
Water stress conditioning of corn (*Zea mays*) in the field and the greenhouse
L.M. DWYER and D.W. STEWART **704**

Dylewski, D.P.
The ultrastructure of plasmodia, sporangia, and cystosori of *Ligniera verrucosa* (Plasmodiophoromycetes)
CHARLES E. MILLER, ROBERT W. MARTIN, and DANIEL P. DYLEWSKI **263**

Eckert, R.T.
Kinetics of potassium uptake in red spruce seedlings
J.R. CUMMING, R.T. ECKERT, and L.S. EVANS **512**

Effect of aluminum on potassium uptake by red spruce seedlings
J.R. CUMMING, R.T. ECKERT, and L.S. EVANS **1099**

Edsall, T.A.
Growth of submersed macrophyte communities in the St. Clair – Detroit river system between Lake Huron and Lake Erie
DONALD W. SCHLOESSER, THOMAS A. EDSALL, and BRUCE A. MANNY **1061**

Edwards, M.E.
Late Wisconsin and Holocene vegetational history of the Upper Koyukuk region, Brooks Range, AK
MARY E. EDWARDS, PATRICIA M. ANDERSON, HARRIET L. GARFINKEL, and LINDA B. BRUBAKER **616**

Ehret, D.L.
Leaf injury to bean plants grown in carbon dioxide enriched atmospheres
DAVID L. EHRET and PETER A. JOLLIFFE **2015**

Growth of bean plants at elevated carbon dioxide concentrations
PETER A. JOLLIFFE and DAVID L. EHRET **2021**

Photosynthetic carbon dioxide exchange of bean plants grown at elevated carbon dioxide concentrations
DAVID L. EHRET and PETER A. JOLLIFFE **2026**

Eilert, U.
Laticifers and latex in fruits of periwinkle, *Catharanthus roseus*
U. Eilert, L.R. Nesbitt, and F. Constabel **1540**

El-Kassaby, Y.A.
Assessing sample size and variable number in multivariate data, with specific reference to cone morphology variation in a population of *Picea sitchensis*
Rob Scagel, Y.A. El-Kassaby, and J. Emanuel **232**

Ellis, J.R.
Vesicular–arbuscular mycorrhizal (*Glomus fasciculatum*) influence on soybean drought tolerance in high phosphorus soil
M.D. Busse and J.R. Ellis **2290**

Ellis, T.H.
Seedling recruitment of 11 wetland plant species along a water level gradient: shared or distinct responses?
Paul A. Keddy and Timothy H. Ellis **1876**

Emanuel, J.
Assessing sample size and variable number in multivariate data, with specific reference to cone morphology variation in a population of *Picea sitchensis*
Rob Scagel, Y.A. El-Kassaby, and J. Emanuel **232**

Engstrom, D.R.
Postglacial vegetational change and soil development in southeastern Labrador as inferred from pollen and chemical stratigraphy
D.R. Engstrom and B.C.S. Hansen **543**

A comparison of numerical and qualitative methods of separating pollen of black and white spruce
B.C.S. Hansen and D.R. Engstrom **2159**

Enkoji, C.
Salinity tolerance in *Spergularia marina*
John M. Cheeseman, P. Bloebaum, Carol Enkoji, and Linda K. Wickens **1762**

Eschrich, W.
Import and unloading of ^{14}C assimilate into mature leaves of *Coleus blumei*
David G. Fisher and Walter Eschrich **1700**

Import and unloading of ^{14}C assimilate into nonphotosynthetic portions of variegated *Coleus blumei* leaves
David G. Fisher and Walter Eschrich **1708**

Esseen, P-A.
Litter fall of epiphytic macrolichens in two old *Picea abies* forests in Sweden
Per-Anders Esseen **980**

Evans, L.S.
Kinetics of potassium uptake in red spruce seedlings
J.R. Cumming, R.T. Eckert, and L.S. Evans **512**

Effect of aluminum on potassium uptake by red spruce seedlings
J.R. Cumming, R.T. Eckert, and L.S. Evans **1099**

Ewen, A.B.
Entomophthora erupta and *Entomophthora helvetica* sp. nov. (Zygomycetes: Entomophthorales), two pathogens of Miridae (Heteroptera) distinguished by pathobiological and nuclear features
I.S. Ben-Ze'ev, S. Keller, and A.B. Ewen **1469**

Farmer, R.E., Jr.
Reproductive characteristics of green alder in northwestern Ontario
R.E. Farmer, Jr., M.L. Maley, M.U. Stoehr, and F. Schnekenburger **2243**

Farr, D.F.
Scanning electron microscopic observations of basidiospores in *Pholiota* and related genera
David F. Farr **603**

Farr, M.L.
A Costa Rican black mildew found in Everglades National Park, Florida
M.L. Farr, Jean D. Schoknecht, and J.L. Crane **1983**

Fedak, G.
Avena atlantica, a new diploid species of the oat genus from Morocco
Bernard R. Baum and George Fedak **1057**

A new tetraploid species of *Avena* discovered in Morocco
Bernard R. Baum and George Fedak **1379**

Ferrand, M.
Ultrastructure de l'oosphère et du zygote du *Marsilea vestita* après un faible abaissement de température
Michèle Ferrand, Eliane Chenou et Janine Kuligowski **859**

Effets de faibles abaissements de température sur la différenciation de l'oosphère et sur les processus de fécondation chez le *Marsilea vestita* (Ptéridophytes)
Éliane Chenou, Janine Kuligowski et Michèle Ferrand **1753**

Fisher, D.G.
Import and unloading of ^{14}C assimilate into mature leaves of *Coleus blumei*
David G. Fisher and Walter Eschrich **1700**

Import and unloading of ^{14}C assimilate into nonphotosynthetic portions of variegated *Coleus blumei* leaves
David G. Fisher and Walter Eschrich **1708**

Flanagan, L.B.
Pattern of ^{14}C assimilate distribution in a clonal herb, *Aralia nudicaulis*
Lawrence B. Flanagan and Walter Moser **2111**

Floh, E.I.S.
Variation of histological patterns in tobacco callus during successive subcultures
Eny I.S. Floh and Walter Handro **1794**

Fortin, J.A.
Synthesized ectomycorrhizae of aspen: fungal genus level of structural characterization
C. Godbout and J.A. Fortin **252**

Fortin, M.G.
Comparative study of two groups of *b* proteins (pathogenesis related) from the intercellular fluid of *Nicotiana* leaf tissue infected by tobacco mosaic virus
Marc G. Fortin, Jean-Guy Parent, and Alain Asselin **932**

Fowke, L.C.
The isolation and cultivation of protoplasts from cell suspensions of a pantothenate-requiring auxotroph of *Datura*
M. Mii, S. Seeni, L.C. Fowke, and J. King **779**

Foy, C.D.
Differential uptake and toxicity of ionic and chelated copper in *Triticum aestivum*
Gregory J. Taylor and Charles D. Foy **1271**

Mechanisms of aluminum tolerance in *Triticum aestivum* (wheat). IV. The role of ammonium and nitrate nutrition
Gregory J. Taylor and Charles D. Foy **2181**

Frego, K.A.
Factors determining the distribution of *Opuntia fragilis* in the boreal forest of southeastern Manitoba
K.A. Frego and R.J. Staniforth **2377**

Fritts, M.C.
Carex jacobi-peteri: a synonym of *Carex pyrenaica* ssp. *micropoda* in Alaska
Sylvia Kelso and Miriam Colson Fritts **2097**

Fuchsman, W.H.
Conservation of leghemoglobin heterogeneity and structures in cultivated and wild soybean
W.H. Fuchsman and R.G. Palmer **1951**

Funk, A.
The anamorph of *Leciographa gallicola*
A. Funk **365**

Hormonema merioides n.sp., on Douglas-fir needles
A. Funk, T.A.D. Woods, and Sarah J. Hopkinson **1579**

Gabrielson, D.A.
Enumeration, location, and characterization of endophytic bacteria within sugar beet roots
MARK J. JACOBS, WILLIAM M. BUGBEE, and DAVID A. GABRIELSON **1262**

Gadawski, R.M.
Hop tree (*Ptelea trifoliata*) in Canada: population and reproductive biology of a rare species
JOHN D. AMBROSE, PETER G. KEVAN, and RANDY M. GADAWSKI **1928**

Dioecy and pollen dimorphism in *Vitis riparia* (Vitaceae)
PETER G. KEVAN, ROBERT W. LONGAIR, and RANDY M. GADAWSKI **2263**

Gafny, R.
Effect of *Azospirillum* spp. inoculation on root development and NO_3^- uptake in wheat (*Triticum aestivum* cv. Miriam) in hydroponic systems
YORAM KAPULNIK, RON GAFNY, and YAACOV OKON **627**

Gagnon, R.
Régression holocène du couvert coniférien à la limite des forêts (Québec nordique)
RÉJEAN GAGNON et SERGE PAYETTE **1213**

Galatis, B.
Studies on the development of the air pores and air chambers of *Marchantia paleacea*. II. Ultrastructure of the initial aperture formation with particular reference to cortical microtubule organizing centres
P. APOSTOLAKOS and B. GALATIS **744**

Galen, C.
The effects of nectar level and flower development on pollen carry-over in inflorescences of fireweed (*Epilobium angustifolium*) (Onagraceae)
C. GALEN and R.C. PLOWRIGHT **488**

Ganders, F.R.
Breeding systems and genetic variation in *Amsinckia spectabilis* (Boraginaceae)
FRED R. GANDERS, SUSAN K. DENNY, and DAVID TSAI **533**

Garfinkel, H.L.
Late Wisconsin and Holocene vegetational history of the Upper Koyukuk region, Brooks Range, AK
MARY E. EDWARDS, PATRICIA M. ANDERSON, HARRIET L. GARFINKEL, and LINDA B. BRUBAKER **616**

Gaudet, D.A.
Penetration and infection of winter wheat leaves by *Coprinus psychromorbidus* under controlled environment conditions
D.A. GAUDET and E.G. KOKKO **955**

Gazeau, C.-M.
Influence de la température et de la durée d'un traitement cryoprotecteur sur la résistance au froid de plantules de blé. Étude ultrastructurale des nucléoles des ébauches foliaires
CLAUDE-MADELEINE GAZEAU?-MADELEINE GAZEAU **663**

Genevès, L.
Formation de globoïdes et de cristaux au cours de l'embryogenèse de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **1914**

Distribution de quelques oligo-éléments dans des cristaux de graines de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **2399**

Gerard, J.
Étude ultrastructural comparée des associations symbiotiques mycorhiziennes *Helianthemum salicifolium – Terfezia claveryi* et *Helianthemum salicifolium – Terfezia leptoderma*
JEAN DEXHEIMER, JOËLLE GERARD, JEAN-PIERRE LEDUC et GÉRARD CHEVALIER **582**

Gerrath, J.F.
The taxonomy of *Synura* (Chrysophyceae) in Ontario with special reference to taste and odour in water supplies
K.H. NICHOLLS and J.F. GERRATH **1482**

Gervais, C.
Extrême précocité et conditions thermiques du développement apical et floral chez *Claytonia caroliniana* var. *caroliniana*
MIROSLAV M. GRANDTNER et CAMILLE GERVAIS **1516**

Gianinazzi, S.
Evaluation of the infectivity and effectiveness of indigenous vesicular–arbuscular fungal populations in some agricultural soils in Burgundy
V. GIANINAZZI-PEARSON, S. GIANINAZZI, and A. TROUVELOT **1521**

Gianinazzi-Pearson, V.
Evaluation of the infectivity and effectiveness of indigenous vesicular–arbuscular fungal populations in some agricultural soils in Burgundy
V. GIANINAZZI-PEARSON, S. GIANINAZZI, and A. TROUVELOT **1521**

Gibson, A.C.
Xylem water potentials and hydraulic conductances in eight species of ferns
HOWARD W. CALKIN, ARTHUR C. GIBSON, and PARK S. NOBEL **632**

Gillespie, T.J.
Uptake of gaseous sulphur dioxide by the lichen *Cladina rangiferina*
B. GRACE, T.J. GILLESPIE, and K.J. PUCKETT **797**

Sulphur dioxide threshold concentration values for *Cladina rangiferina* in the Mackenzie Valley, N.W.T.
B. GRACE, T.J. GILLESPIE, and K.J. PUCKETT **806**

Ginns, J.
Hericium in North America: cultural characteristics and mating behavior
J. GINNS **1551**

Goates, B.J.
Ultrastructure of mitosis and the spindle pole body cycle in the smut fungus, *Tilletia foetida*
JAMES A. HOFFMANN and BLAIR J. GOATES **86**

Godbout, C.
Synthesized ectomycorrhizae of aspen: fungal genus level of structural characterization
C. GODBOUT and J.A. FORTIN **252**

Goertzen, C.A.
Limited uptake as a mechanism for the nonrecoverability of arginine auxotrophs in *Chlamydomonas eugametos*
KAZUO NAKAMURA, CHARLES F. LANDRY, CHRISTINE A. GOERTZEN, and N. WAYNE IKEBUCHI **909**

Goldsborough, L.G.
Seasonal succession of diatom epiphyton on dense mats of *Lemna minor*
L.G. GOLDSBOROUGH and G.G.C. ROBINSON **2332**

Gorecki, R.J.
The volatile exudates from germinating pea seeds of different viability and vigor
R.J. GORECKI, G.E. HARMAN, and L.R. MATTICK **1035**

Goudey, J.S.
The effects of oil spill chemicals on transpiration, CO_2 exchange, and cuticular structure in *Salix interior*
J.S. GOUDEY, M. DALE, and J. HODGINOTT **2340**

Grace, B.
Uptake of gaseous sulphur dioxide by the lichen *Cladina rangiferina*
B. GRACE, T.J. GILLESPIE, and K.J. PUCKETT **797**

Sulphur dioxide threshold concentration values for *Cladina rangiferina* in the Mackenzie Valley, N.W.T.
B. GRACE, T.J. GILLESPIE, and K.J. PUCKETT **806**

Grandtner, M.M.
Extrême précocité et conditions thermiques du développement apical et floral chez *Claytonia caroliniana* var. *caroliniana*
MIROSLAV M. GRANDTNER et CAMILLE GERVAIS **1516**

Grant, M.C.
Genetic variation of lodgepole pine over time and microgeographical space
PEGGY KNOWLES and MICHAEL C. GRANT **722**

Gray, A.B.
Early stages of infection of resistant and susceptible sunflower seedlings by three races of *Plasmopara halstedii*
A. BRUCE GRAY and W.E. SACKSTON **1725**

The development of infection structures of *Plasmopara halstedii* in suspensions of sunflower cells
A. BRUCE GRAY, W.E. SACKSTON, and LOUIS THAUVETTE **1817**

Greenwood, J.S.
Seed development in *Ricinus communis* cv. Hale (castor bean). III. Pattern of storage protein and phytin accumulation in the endosperm
JOHN S. GREENWOOD and J. DEREK BEWLEY **2121**

Grenier, J.
Light-influenced extracellular accumulation of *b* (pathogenesis-related) proteins in *Nicotiana* green tissue induced by various chemicals or prolonged floating on water
ALAIN ASSELIN, JEAN GRENIER, and FRANÇOIS CÔTÉ **1276**

Grenville, D.J.
The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. I. *Pisolithus tinctorius*
D.J. GRENVILLE, R.L. PETERSON, and Y. PICHÉ **1402**

The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. II. *Paxillus involutus*
D.J. GRENVILLE, R.L. PETERSON, and Y. PICHÉ **1412**

Greyson, R.I.
Microsporogenesis and gametophyte maturation in cultured tassels of *Zea mays*
P.L. POLOWICK and R.I. GREYSON **2196**

Griffith, M.
The effects of temperature on the growth and polypeptide composition of several snow mold species
W.J. NEWSTED, N.P.A. HUNER, J.P. INSELL, M. GRIFFITH, and R.B. VAN HUYSTEE **2311**

Grigal, D.F.
Sphagnum production in forested bogs of northern Minnesota
D.F. GRIGAL **1204**

Biomass and productivity of the woody strata of forested bogs in northern Minnesota
D.F. GRIGAL, C.G. BUTTLEMAN, and L.K. KERNIK **2416**

Guého, E.
DNA relatedness among species of *Geotrichum* and *Dipodascus*
EVELINE GUÉHO, JOANNE TREDICK, and HERMAN J. PHAFF **961**

Guillot-Salomon, T.
Interactions hôte–parasite lors de l'infection par *Cercosporella herpotrichoides*, agent du piétin-verse: morphologie du parasite et ultrastructure des parois d'hôtes sensibles et résistants
MARIE-CHRISTINE SOULIE, BRIGITTE VIAN et THÉRÈSE GUILLOT-SALOMON **851**

Haber, E.
The hybrid identity and taxonomic status of *Pyrola sikkimensis* (Ericaceae) from eastern Himalaya
ERICH HABER **133**

Halpern, S.
Formation de globoïdes et de cristaux au cours de l'embryogenèse de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **1914**

Distribution de quelques oligo-éléments dans des cristaux de graines de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **2399**

Hammerschmidt, R.
Association of epidermal lignification with nonhost resistance of cucurbits to fungi
RAYMOND HAMMERSCHMIDT, ALICE M. BONNEN, GARY C. BERGSTROM, and KAREN K. BAKER **2393**

Handro, W.
Variation of histological patterns in tobacco callus during successive subcultures
ENY I.S. FLOH and WALTER HANDRO **1794**

Hansen, B.C.S.
Postglacial vegetational change and soil development in southeastern Labrador as inferred from pollen and chemical stratigraphy
D.R. ENGSTROM and B.C.S. HANSEN **543**

A comparison of numerical and qualitative methods of separating pollen of black and white spruce
B.C.S. HANSEN and D.R. ENGSTROM **2159**

Hanus, D.
Micropropagation de l'érable par bouturage *in vitro* de fragments de germinations de trois espèces
DOMINIQUE HANUS et RENÉ ROHR **277**

Harder, D.E.
Cytochemical studies on *Puccinia graminis* f. sp. *tritici* in a compatible wheat host. I. Walls of intercellular hyphal cells and haustorium mother cells
J. CHONG, D.E. HARDER, and R. ROHRINGER **1713**

Harling, R.
A light microscope study of resistant and susceptible carnations infected with *Fusarium oxysporum* f.sp. *dianthi*
R. HARLING and G.S. TAYLOR **638**

Harman, G.E.
The volatile exudates from germinating pea seeds of different viability and vigor
R.J. GORECKI, G.E. HARMAN, and L.R. MATTICK **1035**

Responses of soil microorganisms to volatile exudates from germinating pea seeds
J.M. NORTON and G.E. HARMAN **1040**

Haufler, C.H.
Triploidy and its evolutionary significance in *Cystopteris protrusa*
CHRISTOPHER H. HAUFLER, MICHAEL D. WINDHAM, DONALD M. BRITTON, and SCOTT J. ROBINSON **1855**

Hauke, R.L.
The transition from vegetative to reproductive growth of shoot apices of holoheterophyadic species of *Equisetum*: phenology, morphology, and anatomy
RICHARD L. HAUKE **2430**

Hawkes, M.W.
Palmaria hecatensis sp. nov. (Rhodophyta, Palmariales) from British Columbia and Alaska with a survey of other *Palmaria* species
MICHAEL W. HAWKES **474**

Hawkins, C.D.B.
Aphid-induced changes in growth indices of three leguminous plants: unrestricted infestation
C.D.B. HAWKINS, M.J. ASTON, and M.I. WHITECROSS **2454**

Hawkins, J.L.
Leaf development and morphology in ash: influence of gamma radiation
JANET R. DUGLE and JANICE L. HAWKINS **1458**

Hayashi, T.
Are charged lipid-linked intermediates involved in the biosynthesis of β-glucans?
ANNE CAMIRAND, KRIKOR TOROSSIAN, TAKAHISA HAYASHI, and GORDON MACLACHLAN **867**

Heath, I.B.
Mitosis and the phylogeny of the genus *Neocallimastix*
I. BRENT HEATH and TOM BAUCHOP **1595**

Heath, M.C.
Morphology, element composition, and response to acids and oxidizing agents of the haustorial neckband of *Uromyces phaseoli* var. *vignae*
MICHÈLE C. HEATH and FRANCES H.E. ALLEN **463**

Comparative analysis of proteins of *Uromyces phaseoli* var. *typica*, *U. phaseoli* var. *vignae*, and *U. viciae-fabae*: polypeptide mapping by two-dimensional electrophoresis
W.K. KIM, MICHÈLE C. HEATH, and R. ROHRINGER **2144**

Hebda, R.J.
Pollen morphology of *Ligusticum* (Apiaceae) in Canada
RICHARD J. HEBDA **1880**

Hellebust, J.A.
Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VI. Phosphate uptake and retention
T.C. HUTCHINSON, C. SOTO, and J.A. HELLEBUST **829**

Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VII. Nitrate and methylamine uptake and retention
J.A. HELLEBUST, C. SOTO, and T.C. HUTCHINSON **834**

Hernandez, M.N.
Des variations d'activités de la 5'-nucléotidase et de l'adénylatecyclase sont-elles des composantes de la levée d'inhibition du bourgeon cotylédonaire du pois?
ARLETTE NOUGARÈDE, PIERRE LANDRÉ, JACQUES REMBUR et MERCEDES NIEBLA HERNANDEZ **309**

Hickman, M.
Growth and biomass allocation of *Ruppia occidentalis* in three lakes, differing in salinity
BRIAN C. HUSBAND and MICHAEL HICKMAN **2004**

Hickok, L.G.
Abscisic acid resistant mutants in the fern *Ceratopteris*: characterization and genetic analysis
LESLIE G. HICKOK **1582**

Hicks, G.
In vitro development of isolated leaf primordia of *Matteuccia struthiopteris*
P. VON ADERKAS and G. HICKS **916**

Hideux, M.
Cytologie ultrastructurale de l'anthère de *Saxifraga*. I. Période d'initiation des précurseurs des sporopollénines au niveau des principaux types exiniques
MICHEL HIDEUX et MICHEL ABADIE **97**

Hinton, D.M.
The distribution and ultrastructure of the endophyte of toxic tall fescue
D.M. HINTON and C.W. BACON **36**

Hiratsuka, Y.
Artificial inoculation of young seedlings of lodgepole pine with *Endocronartium harknessii*
E. ALLEN and Y. HIRATSUKA **1168**

Hoch, J.G.
Evaluation of the presence of double-stranded RNA in *Ceratocystis ulmi*
J.G. HOCH, S.M. TAVANTZIS, R.J. CAMPANA, and S.L. ANAGNOSTAKIS **297**

Hoddinott, J.
The effects of oil spill chemicals on transpiration, CO_2 exchange, and cuticular structure in *Salix interior*
J.S. GOUDEY, M. DALE, and J. HODDINOTT **2340**

Hodgins, R.
Chilling-induced chlorosis in maize (*Zea mays*)
R. HODGINS and R.B. VAN HUYSTEE **711**

Hoffmann, J.A.
Ultrastructure of mitosis and the spindle pole body cycle in the smut fungus, *Tilletia foetida*
JAMES A. HOFFMANN and BLAIR J. GOATES **86**

Hogsett, W.E.
Growth response of two varieties of slash pine seedlings to chronic ozone exposures
W.E. HOGSETT, M. PLOCHER, V. WILDMAN, D.T. TINGEY, and J.P. BENNETT **2369**

Hogue, R.
Glycoproteins, enzymatic activities, and *b* proteins in intercellular fluid extracts from hypersensitive *Nicotiana* species infected with tobacco mosaic virus
JEAN-GUY PARENT, RICHARD HOGUE, and ALAIN ASSELIN **928**

Holley, R.A.
The role of myrosinase in the development of toxicity toward *Nematospora* in mustard seed
R.A. HOLLEY and J.D. JONES **521**

Holthuijzen, A.M.A.
The avian seed dispersal system of eastern red cedar (*Juniperus virginiana*)
ANTHONIE M.A. HOLTHUIJZEN and TERRY L. SHARIK **1508**

Honegger, R.
Chemical and ultrastructural studies on the distribution of sporopolleninlike biopolymers in six genera of lichen phycobionts
UELI BRUNNER and ROSMARIE HONEGGER **2221**

Hopkinson, S.J.
Hormonema merioides n.sp., on Douglas-fir needles
A. FUNK, T.A.D. WOODS, and SARAH J. HOPKINSON **1579**

Horsch, R.B.
Arsenate counterselective enrichment for auxotrophic plant cells works well in theory but not in practice
ROBERT B. HORSCH and JOHN KING **2115**

Howarth, M.J.
Light and electron microscopy of callus initiation from haploid barley embryos
L.S. KOTT, M.J. HOWARTH, R.L. PETERSON, and K.J. KASHA **1801**

Huault, C.
Induction de la synthèse de la δ-aminolévulinate déshydratase des cotylédons de radis étiolés ou cultivés sous lumière rouge lointain par l'érythromycine
CLAUDE HUAULT, PHILIPPE BRUYANT et ALAIN-PIERRE BALANGÉ **950**

Hubbes, M.
Accumulation of phytoalexins in *Ulmus americana* in response to infection by a nonaggressive and an aggressive strain of *Ophiostoma ulmi*
L.C. DUCHESNE, R.S. JENG, and M. HUBBES **678**

Huner, N.P.A.
Acclimation of winter rye to cold-hardening temperatures results in an increased capacity for photosynthetic electron transport
N.P.A. HUNER **506**

Growth and development at cold-hardening temperatures. Pigment and benzoquinone accumulation in winter rye
MARIANNA KROL and NORMAN P.A. HUNER **716**

Light microscopic and polypeptide analyses of sclerotia from mesophilic and psychrophilic pathogenic fungi
JAMES P. INSELL, N.P.A. HUNER, W. JAY NEWSTED, and R.B. VAN HUYSTEE **2305**

The effects of temperature on the growth and polypeptide composition of several snow mold species
W.J. NEWSTED, N.P.A. HUNER, J.P. INSELL, M. GRIFFITH, and R.B. VAN HUYSTEE **2311**

Hunt, L.A.
Carbon dioxide exchange rates and leaf nitrogen contents during ageing of the flag and penultimate leaves of five spring-wheat cultivars
L.A. HUNT and G. VAN DER POORTEN **1605**

Hunt, R.S.
Experimental evidence of heterothallism in *Cronartium ribicola*
R.S. HUNT **1086**

Leptomelanconium pinicola comb. nov. and associated needle blight of pines
R.S. HUNT **1157**

Husband, B.C.
Growth and biomass allocation of *Ruppia occidentalis* in three lakes, differing in salinity
BRIAN C. HUSBAND and MICHAEL HICKMAN **2004**

Hutchinson, T.C.
Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VI. Phosphate uptake and retention
T.C. HUTCHINSON, C. SOTO, and J.A. HELLEBUST **829**

Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VII. Nitrate and methylamine uptake and retention
J.A. HELLEBUST, C. SOTO, and T.C. HUTCHINSON **834**

Hutchison-Benson, E.
The latitudinal inventory of ^{137}Cs in vegetation and topsoil in northern Canada, 1980
E. HUTCHISON-BENSON, J. SVOBODA, and H.W. TAYLOR **784**

Search for latitudinal trends in the effective half-life of fallout ^{137}Cs in vegetation of the Canadian Arctic
H.W. TAYLOR, E. HUTCHISON-BENSON, and J. SVOBODA **792**

Hyde, K.D.
Marine fungi from Seychelles. 1. *Nimbospora effusa* and *Nimbospora bipolaris* sp. nov. from driftwood
KEVIN D. HYDE and E.B. GARETH JONES 611

Ikebuchi, N.W.
Limited uptake as a mechanism for the nonrecoverability of arginine auxotrophs in *Chlamydomonas eugametos*
KAZUO NAKAMURA, CHARLES F. LANDRY, CHRISTINE A. GOERTZEN, and N. WAYNE IKEBUCHI 909

Illman, B.L.
Characterization of the ozone response of potato leaf protoplasts
B.L. ILLMAN and E.J. PELL 1936

Illman, W.I.
A new *Morrisographium*-like species with appendaged conidia assigned to the genus *Conicomyces*
WM.I. ILLMAN and GEORGE P. WHITE 419

The dark synnematous hyphomycete genus *Morrisographium:* described species transferred from *Sphaeronaema, Cornularia, Phragmographium,* and *Arthrobotryum*
WM.I. ILLMAN and GEORGE P. WHITE 423

Insell, J.P.
Light microscopic and polypeptide analyses of sclerotia from mesophilic and psychrophilic pathogenic fungi
JAMES P. INSELL, N.P.A. HUNER, W. JAY NEWSTED, and R.B. VAN HUYSTEE 2305

The effects of temperature on the growth and polypeptide composition of several snow mold species
W.J. NEWSTED, N.P.A. HUNER, J.P. INSELL, M. GRIFFITH, and R.B. VAN HUYSTEE 2311

Ireland, R.J.
Determination of urea and ammonia in leaf extracts: application to ureide metabolism
BARRY J. SHELP, KONRAD SIECIECHOWICZ, ROBERT J. IRELAND, and KENNETH W. JOY 1135

Ishizaki, H.
Cytological studies of the early stages of powdery mildew in barley and wheat. XI. Autofluorescence and haloes at penetration sites of appressoria of *Erysiphe graminis hordei* and *Erysiphe pisi* on barley coleoptiles
H. KUNOH, K. KUNO, and H. ISHIZAKI 1535

Israel, H.W.
Studies in the genus *Strossmayeria* (Helotiales). 5. Conidia and conidiogenesis in *Pseudospiropes*: a light and electron microscope investigation
TERESITA ITURRIAGA and HERBERT W. ISRAEL 195

Chlortetracycline and barley papilla formation: localization of calcium and alteration of the response induced by *Erysiphe graminis*
M.R. MARSHALL, M.G. SMART, J.R. AIST, and H.W. ISRAEL 876

Iturriaga, T.
Studies in the genus *Strossmayeria* (Helotiales). 5. Conidia and conidiogenesis in *Pseudospiropes*: a light and electron microscope investigation
TERESITA ITURRIAGA and HERBERT W. ISRAEL 195

Jacobs, M.J.
Enumeration, location, and characterization of endophytic bacteria within sugar beet roots
MARK J. JACOBS, WILLIAM M. BUGBEE, and DAVID A. GABRIELSON 1262

Jansson, P.-E.
Temporal variation of litter decomposition in relation to simulated soil climate. Long-term decomposition in a Scots pine forest. V
P.-E. JANSSON and B. BERG 1008

Jarvis, W.R.
Sclerotia of *Aspergillus aculeatus*
W.R. JARVIS and J.A. TRAQUAIR 1567

Jeng, R.S.
Accumulation of phytoalexins in *Ulmus americana* in response to infection by a nonaggressive and an aggressive strain of *Ophiostoma ulmi*
L.C. DUCHESNE, R.S. JENG, and M. HUBBES 678

Jensen, R.A.
Glyphosate as a probe of the pentafunctional *arom* protein of *Euglena gracilis*
GRAHAM S. BYNG, ROBERT J. WHITAKER, and ROY A. JENSEN 1021

Jensen, W.A.
Ultrastructural observations of the mature megagametophyte and the fertilization in wheat (*Triticum aestivum*)
RUILIN YOU and WILLIAM A. JENSEN 163

Johnson, F.D.
Pacific yew dominance in tall forests, a classification dilemma
REX C. CRAWFORD and FREDERIC D. JOHNSON 592

Johnson, J.
An extended range for oak wilt and *Ceratocystis fagacearum* compatibility types in the United States
D.N. APPEL, C. FROST DREES, and J. JOHNSON 1325

Johnson, J.D.
Development of a treed bog island in a minerotrophic fen
S.C. ZOLTAI and J.D. JOHNSON 1076

Johnson-Flanagan, A.M.
Development of white spruce (*Picea glauca*) seedling roots
ANNE M. JOHNSON-FLANAGAN and JOHN N. OWENS 456

Johnston, M.
The effect of fire severity level on postfire recovery of hazel and raspberry in east-central Alberta
MARK JOHNSTON and PAUL WOODARD 672

Joines, J.D.
A new chytridiomycete parasitizing the tardigrade *Milnesium tardigradum*
RUTH ANN DEWEL, JERRY D. JOINES, and JOHN J. BOND 1525

Jolliffe, P.A.
Leaf injury to bean plants grown in carbon dioxide enriched atmospheres
DAVID L. EHRET and PETER A. JOLLIFFE 2015

Growth of bean plants at elevated carbon dioxide concentrations
PETER A. JOLLIFFE and DAVID L. EHRET 2021

Photosynthetic carbon dioxide exchange of bean plants grown at elevated carbon dioxide concentrations
DAVID L. EHRET and PETER A. JOLLIFFE 2026

Joly, J.R.
Use of monoclonal antibodies to detect a phytotoxic glycopeptide produced by *Ophiostoma ulmi*, the Dutch elm disease pathogen
NICOLE BENHAMOU, G.B. OUELLETTE, J.G. LAFONTAINE, and J.R. JOLY 1177

Ultrastructural localization in host tissues of a toxic glycopeptide produced by *Ophiostoma ulmi*, using monoclonal antibodies
NICOLE BENHAMOU, J.G. LAFONTAINE, J.R. JOLY, and G.B. OUELLETTE 1185

Jones, E.B.G.
Marine fungi from Seychelles. 1. *Nimbospora effusa* and *Nimbospora bipolaris* sp. nov. from driftwood
KEVIN D. HYDE and E.B. GARETH JONES 611

Monodictys pelagica, the anamorph of *Nereiospora cristata* (Halosphaeriaceae)
R. MOUZOURAS and E.B. GARETH JONES 2444

Jones, G.J.
Floret anthesis and pollination in wild oats (*Avena fatua*)
M.V.S. RAJU, G.J. JONES, and G.F. LEDINGHAM 2187

Jones, J.D.
The role of myrosinase in the development of toxicity toward *Nematospora* in mustard seed
R.A. HOLLEY and J.D. JONES 521

Joshi, M.C.
Concentration, standing state, and cycling of nitrogen in soil–vegetation components of sand and dune herbaceous vegetation around Pilani, Rajasthan, India
ROOM SINGH and M.C. JOSHI 2350

Joy, K.W.
Transamination, deamidation, and the utilisation of asparagine amino nitrogen in pea leaves
TRUNG CHANH TA and KENNETH W. JOY 881

Determination of urea and ammonia in leaf extracts: application to ureide metabolism
BARRY J. SHELP, KONRAD SIECIECHOWICZ, ROBERT J. IRELAND, and KENNETH W. JOY 1135

Jung, G.
Efficiency in a forest nursery of an ectomycorrhizal fungus inoculum produced in a fermentor and entrapped in polymeric gels
F. LE TACON, G. JUNG, J. MUGNIER, P. MICHELOT, and C. MAUPERIN 1664

Kadlec, J.A.
The effects of disturbance on marsh seed banks
LOREN M. SMITH and JOHN A. KADLEC 2133

Kamal
A new species of *Parapyricularia* from India
B. RAI and KAMAL 988

Kameswar Row, K.V.S.R.
Mitosis in the rice blast fungus and its possible implications for pathogenic variability
K.V.S.R. KAMESWAR ROW, J.R. AIST, and J.P. CRILL 1129

Kapoor, N.N.
Influence of 2,4-dichlorophenoxyacetic acid on the starch content of the biflagellate heterotroph *Polytoma uvella:* biochemical and scanning electron microscopic observations
B.S. MANGAT, F. PASQUINI, and N.N. KAPOOR 527

Kapulnik, Y.
Effect of *Azospirillum* spp. inoculation on root development and NO_3^- uptake in wheat (*Triticum aestivum* cv. Miriam) in hydroponic systems
YORAM KAPULNIK, RON GAFNY, and YAACOV OKON 627

Karagatzides, J.D.
Nitrogen fixation in the high arctic tundra at Sarcpa Lake, Northwest Territories
JIM D. KARAGATZIDES, MARTIN C. LEWIS, and HERBERT M. SCHULMAN 974

Kasha, K.J.
Light and electron microscopy of callus initiation from haploid barley embryos
L.S. KOTT, M.J. HOWARTH, R.L. PETERSON, and K.J. KASHA 1801

Callus induction from barley microspores. The role of sucrose and auxin in a barley anther culture medium
A.A. MARSOLAIS and K.J. KASHA 2209

Kavanagh, J.A.
The fine structure of the cystosorus of *Spongospora subterranea*, the cause of powdery scab of potato
H. LAHERT and J.A. KAVANAGH 2278

Keddy, P.A.
Wave disturbance on lakeshores and the within-lake distribution of Ontario's Atlantic coastal plain flora
PAUL A. KEDDY 656

The distribution of *Xyris difformis* along a gradient of exposure to waves: an experimental study
SCOTT D. WILSON, PAUL A. KEDDY, and DEBORAH L. RANDALL 1226

Biomass accumulation by *Rhexia virginica* and *Triadenum fraseri* along two lakeshore gradients: a field experiment
MIREK J. SHARP and PAUL A. KEDDY 1806

Seedling recruitment of 11 wetland plant species along a water level gradient: shared or distinct responses?
PAUL A. KEDDY and TIMOTHY H. ELLIS 1876

Keller, S.
Entomophthora erupta and *Entomophthora helvetica* sp. nov. (Zygomycetes: Entomophthorales), two pathogens of Miridae (Heteroptera) distinguished by pathobiological and nuclear features
I.S. BEN-ZE'EV, S. KELLER, and A.B. EWEN 1469

Kelso, S.
Carex jacobi-peteri: a synonym of *Carex pyrenaica* ssp. *micropoda* in Alaska
SYLVIA KELSO and MIRIAM COLSON FRITTS 2097

Kendall, E.J.
Phase properties of membranes after freezing injury in winter wheat
EDWARD J. KENDALL, BRYAN D. MCKERSIE, and ROBERT H. STINSON 2274

Kennedy, H.
New Ecuadorian species in *Calathea* series *Nudiscapae* (Marantaceae)
HELEN KENNEDY 1141

Foliar, nonstructural nectaries in the Marantaceae
BRUCE K. KIRCHOFF and HELEN KENNEDY 1785

Erratum: A pattern mimic of *Calathea veitchiana* (Marantaceae) from Perú
HELEN KENNEDY 1891

Kernik, L.K.
Biomass and productivity of the woody strata of forested bogs in northern Minnesota
D.F. GRIGAL, C.G. BUTTLEMAN, and L.K. KERNIK 2416

Kevan, P.G.
Hop tree (*Ptelea trifoliata*) in Canada: population and reproductive biology of a rare species
JOHN D. AMBROSE, PETER G. KEVAN, and RANDY M. GADAWSKI 1928

Dioecy and pollen dimorphism in *Vitis riparia* (Vitaceae)
PETER G. KEVAN, ROBERT W. LONGAIR, and RANDY M. GADAWSKI 2263

Kim, W.K.
Comparative analysis of proteins of *Uromyces phaseoli* var. *typica*, *U. phaseoli* var. *vignae*, and *U. viciae-fabae*: polypeptide mapping by two-dimensional electrophoresis
W.K. KIM, MICHÈLE C. HEATH, and R. ROHRINGER 2144

Kimmins, J.P.
Changes in the weight and nutrient composition of litter fall in three forest ecosystem types on coastal British Columbia
J.B. DECATANZARO and J.P. KIMMINS 1046

King, J.
The isolation and cultivation of protoplasts from cell suspensions of a pantothenate-requiring auxotroph of *Datura*
M. MII, S. SEENI, L.C. FOWKE, and J. KING 779

Arsenate counterselective enrichment for auxotrophic plant cells works well in theory but not in practice
ROBERT B. HORSCH and JOHN KING 2115

Kirchoff, B.K.
Foliar, nonstructural nectaries in the Marantaceae
BRUCE K. KIRCHOFF and HELEN KENNEDY 1785

Klein, R.M.
Erratum: Effects of a simulated acidic, metal-containing precipitation on coniferous litter decomposition
KIRK A. MOLONEY, LORI J. STRATTON, and RICHARD M. KLEIN 2081

Knowles, P.
Genetic variation of lodgepole pine over time and microgeographical space
PEGGY KNOWLES and MICHAEL C. GRANT 722

Kohlmeyer, J.
Nimbospora octonae, a new marine ascomycete from Hawaii
JAN KOHLMEYER 1122

Kohn, L.M.
A monographic revision of the genus *Myriosclerotinia*
TROND SCHUMACHER and LINDA M. KOHN 1610

Kokko, E.G.
Penetration and infection of winter wheat leaves by *Coprinus psychromorbidus* under controlled environment conditions
D.A. Gaudet and E.G. Kokko 955

Kott, L.S.
Light and electron microscopy of callus initiation from haploid barley embryos
L.S. Kott, M.J. Howarth, R.L. Peterson, and K.J. Kasha 1801

Kreitner, G.L.
Stigma development and the stigmatic cuticle of *Medicago scutellata*
G.L. Kreitner and E.L. Sorensen 813

Kress, L.W.
Impact of ozone on field-corn yield
L.W. Kress and J.E. Miller 2408

Krol, M.
Growth and development at cold-hardening temperatures. Pigment and benzoquinone accumulation in winter rye
Marianna Krol and Norman P.A. Huner 716

Kuijt, J.
Anatomy and ultrastructure of the endophytic system of *Pilostyles thurberi* (Rafflesiaceae)
Job Kuijt, D. Bray, and A.R. Olson 1231

Kuligowski, J.
Ultrastructure de l'oosphère et du zygote du *Marsilea vestita* après un faible abaissement de température
Michèle Ferrand, Eliane Chenou et Janine Kuligowski 859

Effets de faibles abaissements de température sur la différenciation de l'oosphère et sur les processus de fécondation chez le *Marsilea vestita* (Ptéridophytes)
Éliane Chenou, Janine Kuligowski et Michèle Ferrand 1753

Kuno, K.
Cytological studies of the early stages of powdery mildew in barley and wheat. XI. Autofluorescence and haloes at penetration sites of appressoria of *Erysiphe graminis hordei* and *Erysiphe pisi* on barley coleoptiles
H. Kunoh, K. Kuno, and H. Ishizaki 1535

Kunoh, H.
Cytological studies of the early stages of powdery mildew in barley and wheat. XI. Autofluorescence and haloes at penetration sites of appressoria of *Erysiphe graminis hordei* and *Erysiphe pisi* on barley coleoptiles
H. Kunoh, K. Kuno, and H. Ishizaki 1535

Labrecque, M.
Développement du fruit de *Prunus virginiana* (Rosaceae)
Michel Labrecque, Denis Barabé et Joachim Vieth 242

La Duke, J.C.
Biology of *Trillium nivale* (Liliaceae)
Guy L. Nesom and John C. La Duke 7

Lafontaine, J.G.
Use of monoclonal antibodies to detect a phytotoxic glycopeptide produced by *Ophiostoma ulmi*, the Dutch elm disease pathogen
Nicole Benhamou, G.B. Ouellette, J.G. Lafontaine, and J.R. Joly 1177

Ultrastructural localization in host tissues of a toxic glycopeptide produced by *Ophiostoma ulmi*, using monoclonal antibodies
Nicole Benhamou, J.G. Lafontaine, J.R. Joly, and G.B. Ouellette 1185

Lahert, H.
The fine structure of the cystosorus of *Spongospora subterranea*, the cause of powdery scab of potato
H. Lahert and J.A. Kavanagh 2278

Lakanmi, O.O.
The growth of *Luffa aegyptiaca* in response to various nitrogen sources and concentrations
Olubukanla T. Okusanya and Olusola O. Lakanmi 2283

Lallemant, R.
Le développement en cultures pures *in vitro* des mycosymbiotes des lichens
Richard Lallemant 681

Lalonde, L.
Desiccation of imbibed and germinating pea axes causes a partial reversal of germination events
Louise Lalonde and J. Derek Bewley 2248

Lalonde, M.
Nodulation speed of *Frankia* sp. on *Alnus glutinosa*, *Alnus crispa*, and *Myrica gale*
Xavier Nesme, Philippe Normand, Francine M. Tremblay, and Maurice Lalonde 1292

Lancelle, S.A.
Early development of *Rhizobium*-induced root nodules of *Parasponia rigida*. II. Nodule morphogenesis and symbiotic development
Susan A. Lancelle and John G. Torrey 25

Landré, P.
Des variations d'activités de la 5′-nucléotidase et de l'adénylatecyclase solubles des composantes de la levée d'inhibition du bourgeon cotylédonaire du pois?
Arlette Nougarède, Pierre Landré, Jacques Rembur et Mercedes Niebla Hernandez 369

État nucléaire des méristèmes du pois dans la graine sèche; imbibition et reprise du cycle cellulaire
E. Schatt, P. Landré et A. Nougarède 2200

Landry, C.F.
Limited uptake as a mechanism for the nonrecoverability of arginine auxotrophs in *Chlamydomonas eugametos*
Kazuo Nakamura, Charles F. Landry, Christine A. Goertzen, and N. Wayne Ikebuchi 909

Larson, D.W.
The ecology of *Ramalina menziesii*. I. Geographical variation in form
D.W. Larson, U. Matthes-Sears, and T.H. Nash III 2062

Larson, P.R.
Rachis vascularization and leaflet venation in developing leaves of *Fraxinus pennsylvanica*
Philip R. Larson 2383

Latgé, J.P.
Optimisation de la croissance et de la sporulation de *Conidiobolus obscurus* en milieu défini
J.P. Latgé et J.J. Sanglier 68

Layzell, D.B.
A morphometric study of effective nodules induced by *Rhizobium loti* and *Bradyrhizobium* sp. *(Lotus)* on *Lotus pedunculatus*
Susan M. Wood, David B. Layzell, William Newcomb, and Clive E. Pankhurst 43

A culture system enabling *in situ* determination of net and gross photosynthesis, O_2 evolution, N assimilation, and C_2H_2 reduction in cyanobacteria
David H. Turpin and David B. Layzell 1025

Lechowicz, M.J.
A multivariate approach to plant mineral nutrition: dose–response relationships and nutrient dominance in factorial experiments
G.R. Shaver and M.J. Lechowicz 2138

Leclerc, J.-C.
Premières données sur l'activité photosynthétique de quelques algues subaériennes vivant en milieux très peu éclairés
Jean-Claude Leclerc 1893

Ledingham, G.F.
Floret anthesis and pollination in wild oats (*Avena fatua*)
M.V.S. Raju, G.J. Jones, and G.F. Ledingham 2187

Leduc, J.-P.
Étude ultrastructural comparée des associations symbiotiques mycorhiziennes *Helianthemum salicifolium – Terfezia claveryi* et *Helianthemum salicifolium – Terfezia leptoderma*
JEAN DEXHEIMER, JOËLLE GERARD, JEAN-PIERRE LEDUC et GÉRARD CHEVALIER **582**

Lefkovitch, L.P.
Restricted taxonomic value of leaf sections in Canadian narrow-leaved *Festuca* (Poaceae)
S.G. AIKEN, S.J. DARBYSHIRE, and L.P. LEFKOVITCH **995**

Lescure, C.
Étude de l'influence des réserves azotées dans l'estimation par ^{15}N de la fixation symbiotique d'une plante pérenne, *Trifolium pratense*
CHANTAL LESCURE et ALAIN CHALAMET **991**

Le Tacon, F.
Efficiency in a forest nursery of an ectomycorrhizal fungus inoculum produced in a fermentor and entrapped in polymeric gels
F. LE TACON, G. JUNG, J. MUGNIER, P. MICHELOT, and C. MAUPERIN **1664**

Letouze, R.
Relations entre hypolignification et état vitreux chez *Salix babylonica* en culture *in vitro*. Rôle de la nutrition ammoniacale
F. DAGUIN et R. LETOUZE **324**

Lewis, M.C.
Nitrogen fixation in the high arctic tundra at Sarcpa Lake, Northwest Territories
JIM D. KARAGATZIDES, MARTIN C. LEWIS, and HERBERT M. SCHULMAN **974**

Li, J.-R.
Effects of cotyledon removal on apple seedling growth and distribution of ^{14}C-labelled photosynthates
JIA-RUI LI, J.T.A. PROCTOR, and D.P. MURR **1736**

Lisker, N.
Accumulation of ochratoxin A in sclerotia of *Aspergillus ochraceus*
N. PASTER, N. LISKER, and I. CHET **661**

Lobban, C.S.
Marine tube-dwelling diatoms of the Pacific coast of North America. I. *Berkeleya, Haslea, Nitzschia,* and *Navicula* sect. *Microstigmaticae*
CHRISTOPHER S. LOBBAN **1779**

Longair, R.W.
Dioecy and pollen dimorphism in *Vitis riparia* (Vitaceae)
PETER G. KEVAN, ROBERT W. LONGAIR, and RANDY M. GADAWSKI **2263**

Longly, B.
Développement floral chez *Eragrotis tef*: dynamique des gamétophytogenèses
B. LONGLY, T. RABAU et B.P. LOUANT **1900**

Lotan, J.E.
Serotiny and life history of *Pinus contorta* var. *latifolia*
PATRICIA S. MUIR and JAMES E. LOTAN **938**

Louant, B.P.
Développement floral chez *Eragrotis tef*: dynamique des gamétophytogenèses
B. LONGLY, T. RABAU et B.P. LOUANT **1900**

Lucas, W.J.
Sugar beet petiole structure: vascular anastomoses and phloem ultrastructure
JOHN W. OROSS and WILLIAM J. LUCAS **2295**

Luken, J.O.
Succession and biomass allocation as controlled by *Sphagnum* in an Alaskan peatland
J.O. LUKEN, W.D. BILLINGS, and K.M. PETERSON **1500**

Lyrene, P.M.
Reproductive incompatibility barriers in crosses between *Vaccinium corymbosum* and *V. elliottii*
C.E. MUNOZ and P.M. LYRENE **1987**

MacDonald, J.E.
First growing period development of *Acer saccharum* stump sprouts arising after different dates of cut
JOANNE E. MACDONALD and G.R. POWELL **819**

Macdowall, F.D.H.
Influence of nitrogen supply on developmental kinetics of symbiotic and nonsymbiotic alfalfa cv. Algonquin through first flowering
F.D.H. MACDOWALL **841**

Influence of carbon supply on developmental kinetics of symbiotic and nonsymbiotic alfalfa cv. Algonquin through first flowering
F.D.H. MACDOWALL **847**

MacFarlane, J.D.
Electrophoretic and allometric variation in burdock (*Arctium* spp.): hybridization and its ecological implications
C. DAVID ROLLO, J.D. MACFARLANE, and B.S. SMITH **1255**

Maclachlan, G.
Are charged lipid-linked intermediates involved in the biosynthesis of β-glucans?
ANNE CAMIRAND, KRIKOR TOROSSIAN, TAKAHISA HAYASHI, and GORDON MACLACHLAN **867**

Madhosingh, C.
The photosensitization of the plant pathogen *Fusarium culmorum* by phenylheptatriyne from *Bidens pilosa*
G. BOURQUE, J.T. ARNASON, C. MADHOSINGH, and W. ORR **899**

Mahon, J.D.
An automated computer-controlled gas-exchange system for continual monitoring of physiological activities in plants
JOHN D. MAHON and MAUREEN F. DENNIS **2213**

Maley, M.L.
Reproductive characteristics of green alder in northwestern Ontario
R.E. FARMER, JR., M.L. MALEY, M.U. STOEHR, and F. SCHNEKENBURGER **2243**

Malloch, D.
The occurrence of ectomycorrhizae in some species of Cistaceae in North America
DAVID MALLOCH and R. GREG THORN **872**

Mangat, B.S.
Influence of 2,4-dichlorophenoxyacetic acid on the starch content of the biflagellate heterotroph *Polytoma uvella:* biochemical and scanning electron microscopic observations
B.S. MANGAT, F. PASQUINI, and N.N. KAPOOR **527**

Changes in sugar nucleotide pyrophosphorylases and starch during growth in cultures of *Polytoma uvella* and *Polytomella papillata*
B.S. MANGAT and M.L. PELEKIS **946**

Manny, B.A.
Growth of submersed macrophyte communities in the St. Clair – Detroit river system between Lake Huron and Lake Erie
DONALD W. SCHLOESSER, THOMAS A. EDSALL, and BRUCE A. MANNY **1061**

Manocha, M.S.
Specificity of mycoparasite attachment to the host cell surface
M.S. MANOCHA **772**

Suppression of host cell wall synthesis at penetration sites in a compatible interaction with a mycoparasite
M.S. MANOCHA and C.M. MCCULLOUGH **967**

Marshall, M.R.
Chlortetracycline and barley papilla formation: localization of calcium and alteration of the response induced by *Erysiphe graminis*
M.R. MARSHALL, M.G. SMART, J.R. AIST, and H.W. ISRAEL **876**

Marsolais, A.A.
Callus induction from barley microspores. The role of sucrose and auxin in a barley anther culture medium
A.A. MARSOLAIS and K.J. KASHA **2209**

Martin, R.W.
The ultrastructure of plasmodia, sporangia, and cystosori of *Ligniera verrucosa* (Plasmodiophoromycetes)
CHARLES E. MILLER, ROBERT W. MARTIN, and DANIEL P. DYLEWSKI 263

Martínez, A.T.
Aphysiostroma, a new nonostiolate hypocrealean fungus
J.M. BARRASA, A.T. MARTÍNEZ, and G. MORENO 2439

Matsumoto, N.
Field survival of sclerotia of *Typhula incarnata* and of *T. ishikariensis* biotype A
N. MATSUMOTO and A. TAJIMI 1126

Matthes-Sears, U.
The ecology of *Ramalina menziesii*. I. Geographical variation in form
D.W. LARSON, U. MATTHES-SEARS, and T.V. NASH III 2062

Mattick, L.R.
The volatile exudates from germinating pea seeds of different viability and vigor
R.J. GORECKI, G.E. HARMAN, and L.R. MATTICK 1035

Maun, M.A.
Population biology of *Ammophila breviligulata* and *Calamovilfa longifolia* on Lake Huron sand dunes. I. Habitat, growth form, reproduction, and establishment
M.A. MAUN 113

Spatial pattern and seed dispersal of *Lithospermum caroliniense* on Lake Huron sand dunes
IRENE L. WESTELAKEN and M.A. MAUN 125

Mauperin, C.
Efficiency in a forest nursery of an ectomycorrhizal fungus inoculum produced in a fermentor and entrapped in polymeric gels
F. LE TACON, G. JUNG, J. MUGNIER, P. MICHELOT, and C. MAUPERIN 1664

Mauseth, J.D.
Host infection and flower formation by the parasite *Tristerix aphyllus* (Loranthaceae)
JAMES D. MAUSETH, GLORIA MONTENEGRO, and
ALAN M. WALCKOWIAK 567

Maze, J.
Quantitative studies in early ovule development. I. Intraindividual variation in *Nothofagus antarctica*
R.K. SCAGEL, J. MAZE, L.R. BOHM, and N.L. VOGT 1769

McCullough, C.M.
Suppression of host cell wall synthesis at penetration sites in a compatible interaction with a mycoparasite
M.S. MANOCHA and C.M. MCCULLOUGH 967

McCune, B.
Will similar forests develop on similar sites?
BRUCE MCCUNE and T.F.H. ALLEN 367

Forest dynamics in the Bitterroot Canyons, Montana
BRUCE MCCUNE and T.F.H. ALLEN 377

McIntosh, M.S.
Effects of nitrogen and phosphorus fertilization on growth and formation of ectomycorrhizae of *Quercus alba* and *Q. rubra* seedlings by *Pisolithus tinctorius* and *Scleroderma auranteum*
PETER R. BECKJORD, JOHN H. MELHUISH, JR., and
MARLA S. MCINTOSH 1677

McKersie, B.D.
Injury within the crown of winter wheat seedlings after freezing and icing stress
KAREN K. TANINO and BRYAN D. MCKERSIE 432

Phase properties of membranes after freezing injury in winter wheat
EDWARD J. KENDALL, BRYAN D. MCKERSIE, and ROBERT H. STINSON 2274

McNeill, J.
Anthocyanin pigmentation in seedlings of selected species of *Phaseolus* and *Vigna* (Fabaceae)
CONSTANCE NOZZOLILLO and JOHN MCNEILL 1066

Melhuish, J.H., Jr.
Effects of nitrogen and phosphorus fertilization on growth and formation of ectomycorrhizae of *Quercus alba* and *Q. rubra* seedlings by *Pisolithus tinctorius* and *Scleroderma auranteum*
PETER R. BECKJORD, JOHN H. MELHUISH, JR., and
MARLA S. MCINTOSH 1677

Michelot, P.
Efficiency in a forest nursery of an ectomycorrhizal fungus inoculum produced in a fermentor and entrapped in polymeric gels
F. LE TACON, G. JUNG, J. MUGNIER, P. MICHELOT, and C. MAUPERIN 1664

Mii, M.
The isolation and cultivation of protoplasts from cell suspensions of a pantothenate-requiring auxotroph of *Datura*
M. MII, S. SEENI, L.C. FOWKE, and J. KING 779

Miller, C.E.
The ultrastructure of plasmodia, sporangia, and cystosori of *Ligniera verrucosa* (Plasmodiophoromycetes)
CHARLES E. MILLER, ROBERT W. MARTIN, and DANIEL P. DYLEWSKI 263

Miller, J.E.
Impact of ozone on field-corn yield
L.W. KRESS and J.E. MILLER 2408

Mills, D.
Heterokaryon formation *in planta* by genetically marked strains of *Tilletia caries*
A.C.L. CHURCHILL and DALLICE MILLS 1924

Mitchell, D.J.
Influence of water potential on the survival and saprophytic activity of *Rhizoctonia solani* AG 4 in natural soil
R.C. PLOETZ and D.J. MITCHELL 2364

Moloney, K.A.
Erratum: Effects of a simulated acidic, metal-containing precipitation on coniferous litter decomposition
KIRK A. MOLONEY, LORI J. STRATTON, and RICHARD M. KLEIN 2081

Montenegro, G.
Host infection and flower formation by the parasite *Tristerix aphyllus* (Loranthaceae)
JAMES D. MAUSETH, GLORIA MONTENEGRO, and
ALAN M. WALCKOWIAK 567

Moore, D.R.J.
A comparison of seedling vigour in crop and weed biotypes of proso millet (*Panicum miliaceum*)
DWAYNE R.J. MOORE and PAUL B. CAVERS 1659

Moore, R.
Geoperception in primary and lateral roots of *Phaseolus vulgaris* (Fabaceae). III. A model to explain the differential georesponsiveness of primary and lateral roots
J. STEVEN RANSOM and RANDY MOORE 21

Moore, T.R.
A preliminary investigation of primary production and decomposition in four peatlands near Schefferville, Québec
I. BARTSCH and T.R. MOORE 1241

Moreau, R.A.
Production of extracellular enzymes by germinating cysts of *Phytophthora infestans*
ROBERT A. MOREAU and THOMAS S. SEIBLES 1811

Moreno, G.
Aphysiostroma, a new nonostiolate hypocrealean fungus
J.M. BARRASA, A.T. MARTÍNEZ, and G. MORENO 2439

Morikawa, C.
Electron microscopy on a nematode-trapping fungus, *Acaulopage pectospora*
MASATOSHI SAIKAWA and CHIHARU MORIKAWA 1386

Morisset, P.
Races chromosomiques chez *Festuca rubra sensu lato* (Poaceae) dans l'est du Québec
MARTIN DUBÉ, PIERRE MORISSET et JANOUK MURDOCK 227

Chromosome studies on natural hybrids between maritime species of *Carex* (sections *Phacocystis* and *Cryptocarpae*) in northeastern North America, and their taxonomic implications
JACQUES CAYOUETTE and PIERRE MORISSET 1957

Moser, W.
Pattern of ^{14}C assimilate distribution in a clonal herb, *Aralia nudicaulis*
LAWRENCE B. FLANAGAN and WALTER MOSER 2111

Mouzouras, R.
Monodictys pelagica, the anamorph of *Nereiospora cristata* (Halosphaeriaceae)
R. MOUZOURAS and E.B. GARETH JONES 2444

Mugnier, J.
Efficiency in a forest nursery of an ectomycorrhizal fungus inoculum produced in a fermentor and entrapped in polymeric gels
F. LE TACON, G. JUNG, J. MUGNIER, P. MICHELOT, and C. MAUPERIN 1664

Muir, P.S.
Serotiny and life history of *Pinus contorta* var. *latifolia*
PATRICIA S. MUIR and JAMES E. LOTAN 938

Mukherji, S.
Penicillin action stimulating growth and metabolism in seedlings of rice (*Oryza sativa*)
S. MUKHERJI and A.K. BISWAS 1150

Müller, K.
Colonization of *Sphagnum* cells by *Lyophyllum palustre*
E. UNTIEDT and K. MÜLLER 757

Muniyamma, M.
Studies in *Crataegus*. XII. Cytological evidence for sexuality in some diploid and tetraploid species of North American hawthorns
M. MUNIYAMMA and J.B. PHIPPS 1319

Munoz, C.E.
Reproductive incompatibility barriers in crosses between *Vaccinium corymbosum* and *V. elliottii*
C.E. MUNOZ and P.M. LYRENE 1987

Murdock, J.
Races chromosomiques chez *Festuca rubra sensu lato* (Poaceae) dans l'est du Québec
MARTIN DUBÉ, PIERRE MORISSET et JANOUK MURDOCK 227

Murr, D.P.
Effects of cotyledon removal on apple seedling growth and distribution of ^{14}C-labelled photosynthates
JIA-RUI LI, J.T.A. PROCTOR, and D.P. MURR 1736

Nakamura, K.
Limited uptake as a mechanism for the nonrecoverability of arginine auxotrophs in *Chlamydomonas eugametos*
KAZUO NAKAMURA, CHARLES F. LANDRY, CHRISTINE A. GOERTZEN, and N. WAYNE IKEBUCHI 909

Nash, T.H., III
The ecology of *Ramalina menziesii*. I. Geographical variation in form
D.W. LARSON, U. MATTHES-SEARS, and T.H. NASH III 2062

Neale, D.B.
Allozyme and mating-system variation in balsam fir (*Abies balsamea*) across a continuous elevational transect
D.B. NEALE and W.T. ADAMS 2448

Nesbitt, L.R.
Laticifers and latex in fruits of periwinkle, *Catharanthus roseus*
U. EILERT, L.R. NESBITT, and F. CONSTABEL 1540

Nesme, X.
Nodulation speed of *Frankia* sp. on *Alnus glutinosa*, *Alnus crispa*, and *Myrica gale*
XAVIER NESME, PHILIPPE NORMAND, FRANCINE M. TREMBLAY, and MAURICE LALONDE 1292

Nesom, G.L.
Biology of *Trillium nivale* (Liliaceae)
GUY L. NESOM and JOHN C. LA DUKE 7

Newcomb, W.
A morphometric study of effective nodules induced by *Rhizobium loti* and *Bradyrhizobium* sp. *(Lotus)* on *Lotus pedunculatus*
SUSAN M. WOOD, DAVID B. LAYZELL, WILLIAM NEWCOMB, and CLIVE E. PANKHURST 43

Newman, R.F.
Range extensions of grassland species in southern interior British Columbia
BRIAN M. WIKEEM and REG F. NEWMAN 2240

Newsted, W.J.
Light microscopic and polypeptide analyses of sclerotia from mesophilic and psychrophilic pathogenic fungi
JAMES P. INSELL, N.P.A. HUNER, W. JAY NEWSTED, and R.B. VAN HUYSTEE 2305

The effects of temperature on the growth and polypeptide composition of several snow mold species
W.J. NEWSTED, N.P.A. HUNER, J.P. INSELL, M. GRIFFITH, and R.B. VAN HUYSTEE 2311

Nicholls, K.H.
Five *Paraphysomonas* species (Chrysophyceae) new to North America, with notes on three other rarely reported species
K.H. NICHOLLS 1208

The taxonomy of *Synura* (Chrysophyceae) in Ontario with special reference to taste and odour in water supplies
K.H. NICHOLLS and J.F. GERRATH 1482

Nieboer, E.
Uranium accumulation in the lichen *Cladonia rangiferina*. Part I. Uptake of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. BOILEAU, E. NIEBOER, and D.H.S. RICHARDSON 384

Uranium accumulation in the lichen *Cladonia rangiferina*. Part II. Toxic effects of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. BOILEAU, E. NIEBOER, and D.H.S. RICHARDSON 390

Nielsen, J.
Ustilago spp. pathogenic on *Aegilops*. II. *Ustilago tritici*
J. NIELSEN 765

Nobel, P.S.
Xylem water potentials and hydraulic conductances in eight species of ferns
HOWARD W. CALKIN, ARTHUR C. GIBSON, and PARK S. NOBEL 632

Nordgren, A.
Soil microfungi in an area polluted by heavy metals
ANDERS NORDGREN, ERLAND BÅÅTH, and BENGT SÖDERSTRÖM 448

Normand, P.
Nodulation speed of *Frankia* sp. on *Alnus glutinosa*, *Alnus crispa*, and *Myrica gale*
XAVIER NESME, PHILIPPE NORMAND, FRANCINE M. TREMBLAY, and MAURICE LALONDE 1292

Northover, J.
Formation of the primary protective layer and phellogen after leaf abscission in peach
A.R. BIGGS and J. NORTHOVER 1547

Norton, J.M.
Responses of soil microorganisms to volatile exudates from germinating pea seeds
J.M. NORTON and G.E. HARMAN 1040

Nougarède, A.
Des variations d'activités de la 5'-nucléotidase et de l'adénylatecyclase sont-elles des composantes de la levée d'inhibition du bourgeon cotylédonaire du pois?
Arlette Nougarède, Pierre Landré, Jacques Rembur et Mercedes Niebla Hernandez 309

État nucléaire des méristèmes du pois dans la graine sèche; imbibition et reprise du cycle cellulaire
E. Schatt, P. Landré et A. Nougarède 2200

Nozzolillo, C.
Seedling morphology and anatomy of eight *Cicer* species and their taxonomic value
Constance Nozzolillo 1

Anthocyanin pigmentation in seedlings of selected species of *Phaseolus* and *Vigna* (Fabaceae)
Constance Nozzolillo and John McNeill 1965

O'Grady, K.
Physiological ecology of the bloom-forming alga *Chrysochromulina breviturrita* (Prymnesiophyceae) from lakes influenced by acid precipitation
John D. Wehr, Lewis M. Brown, and Kathryn O'Grady 2231

O'Keefe, J.F.
Longevity and persistence of alder west of the tree line on the Seward Peninsula, Alaska
Brayton F. Wilson, William A. Patterson III, and John F. O'Keefe 1870

Okon, Y.
Effect of *Azospirillum* spp. inoculation on root development and NO_3^- uptake in wheat (*Triticum aestivum* cv. Miriam) in hydroponic systems
Yoram Kapulnik, Ron Gafny, and Yaacov Okon 627

Okusanya, O.T.
The growth of *Luffa aegyptiaca* in response to various nitrogen sources and concentrations
Olubukanla T. Okusanya and Olusola O. Lakanmi 2283

Olson, A.R.
Anatomy and ultrastructure of the endophytic system of *Pilostyles thurberi* (Rafflesiaceae)
Job Kuijt, D. Bray, and A.R. Olson 1231

Oross, J.W.
Sugar beet petiole structure: vascular anastomoses and phloem ultrastructure
John W. Oross and William J. Lucas 2295

Orr, W.
The photosensitization of the plant pathogen *Fusarium culmorum* by phenylheptatriyne from *Bidens pilosa*
G. Bourque, J.T. Arnason, C. Madhosingh, and W. Orr 899

Ouellette, G.B.
Use of monoclonal antibodies to detect a phytotoxic glycopeptide produced by *Ophiostoma ulmi*, the Dutch elm disease pathogen
Nicole Benhamou, G.B. Ouellette, J.G. Lafontaine, and J.R. Joly 1177

Ultrastructural localization in host tissues of a toxic glycopeptide produced by *Ophiostoma ulmi*, using monoclonal antibodies
Nicole Benhamou, J.G. Lafontaine, J.R. Joly, and G.B. Ouellette 1185

Owens, J.N.
Development of white spruce (*Picea glauca*) seedling roots
Anne M. Johnson-Flanagan and John N. Owens 456

Pallardy, S.G.
Stem vascular anatomy and leaf area in seedlings of six black walnut (*Juglans nigra*) families
William C. Parker and Stephen G. Pallardy 1266

Palmer, R.G.
Conservation of leghemoglobin heterogeneity and structures in cultivated and wild soybean
W.H. Fuchsman and R.G. Palmer 1951

Pankhurst, C.E.
A morphometric study of effective nodules induced by *Rhizobium loti* and *Bradyrhizobium* sp. *(Lotus)* on *Lotus pedunculatus*
Susan M. Wood, David B. Layzell, William Newcomb, and Clive E. Pankhurst 43

Parent, J.-G.
Glycoproteins, enzymatic activities, and *b* proteins in intercellular fluid extracts from hypersensitive *Nicotiana* species infected with tobacco mosaic virus
Jean-Guy Parent, Richard Hogue, and Alain Asselin 928

Comparative study of two groups of *b* proteins (pathogenesis related) from the intercellular fluid of *Nicotiana* leaf tissue infected by tobacco mosaic virus
Marc G. Fortin, Jean-Guy Parent, and Alain Asselin 932

Parker, W.C.
Stem vascular anatomy and leaf area in seedlings of six black walnut (*Juglans nigra*) families
William C. Parker and Stephen G. Pallardy 1266

Parkinson, D.
Effects of sulphur pollution on rates of litter decomposition in a pine forest
Cindy E. Prescott and Dennis Parkinson 1436

Decomposition of timothy (*Phleum pratense*) litter on a reclaimed surface coal mine in Alberta, Canada
D.M. Durall, W.F.J. Parsons, and D. Parkinson 1586

Parsons, W.F.J.
Decomposition of timothy (*Phleum pratense*) litter on a reclaimed surface coal mine in Alberta, Canada
D.M. Durall, W.F.J. Parsons, and D. Parkinson 1586

Parvathi, K.
Toxicity of soil-applied fungicides and gypsum to the vesicular–arbuscular mycorrhizal fungus *Glomus mosseae* in groundnut
K. Parvathi, K. Venkateswarlu, and A.S. Rao 1673

Pasquini, F.
Influence of 2,4-dichlorophenoxyacetic acid on the starch content of the biflagellate heterotroph *Polytoma uvella:* biochemical and scanning electron microscopic observations
B.S. Mangat, F. Pasquini, and N.N. Kapoor 527

Paster, N.
Accumulation of ochratoxin A in sclerotia of *Aspergillus ochraceus*
N. Paster, N. Lisker, and I. Chet 661

Patterson, W.A., III
Longevity and persistence of alder west of the tree line on the Seward Peninsula, Alaska
Brayton F. Wilson, William A. Patterson III, and John F. O'Keefe 1870

Pavone, L.V.
Reproductive schedule of *Medicago lupulina* (Leguminosae) in a patchy environment
L.V. Pavone and R.J. Reader 2044

Payette, S.
Évolution holocène d'une tourbière à pergélisol (Québec nordique)
Line Couillard et Serge Payette 1104

Régression holocène du couvert conifèrien à la limite des forêts (Québec nordique)
Réjean Gagnon et Serge Payette 1213

Pelekis, M.L.
Changes in sugar nucleotide pyrophosphorylases and starch during growth in cultures of *Polytoma uvella* and *Polytomella papillata*
B.S. Mangat and M.L. Pelekis 946

Pell, E.J.
Characterization of the ozone response of potato leaf protoplasts
B.L. Illman and E.J. Pell 1936

Peterson, C.A.
Developmental studies of the stratification–germination process in sugar maple embryos
C.Y. Shih, E.B. Dumbroff, and Carol A. Peterson 903

Peterson, K.M.
Succession and biomass allocation as controlled by *Sphagnum* in an Alaskan peatland
J.O. Luken, W.D. Billings, and K.M. Peterson 1500

Peterson, R.L.
A developmental study of the early stages in vesicular–arbuscular mycorrhiza formation
M.C. Brundrett, Y. Piché, and R.L. Peterson 184

The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. I. *Pisolithus tinctorius*
D.J. Grenville, R.L. Peterson, and Y. Piché 1402

The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. II. *Paxillus involutus*
D.J. Grenville, R.L. Peterson, and Y. Piché 1412

Light and electron microscopy of callus initiation from haploid barley embryos
L.S. Kott, M.J. Howarth, R.L. Peterson, and K.J. Kasha 1801

Peteya, D.J.
Megagametophyte development in *Hordeum vulgare*. I. Early megagametogenesis and the nature of cell wall formation
D.D. Cass, D.J. Peteya, and B.L. Robertson 2164

Phaff, H.J.
DNA relatedness among species of *Geotrichum* and *Dipodascus*
Eveline Guého, Joanne Tredick, and Herman J. Phaff 961

Phipps, J.B.
Studies in *Crataegus*. XII. Cytological evidence for sexuality in some diploid and tetraploid species of North American hawthorns
M. Muniyamma and J.B. Phipps 1319

Piché, Y.
A developmental study of the early stages in vesicular–arbuscular mycorrhiza formation
M.C. Brundrett, Y. Piché, and R.L. Peterson 184

The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. I. *Pisolithus tinctorius*
D.J. Grenville, R.L. Peterson, and Y. Piché 1402

The development, structure, and histochemistry of sclerotia of ectomycorrhizal fungi. II. *Paxillus involutus*
D.J. Grenville, R.L. Peterson, and Y. Piché 1412

Pitelka, L.F.
Biomass allocation in *Aster acuminatus*: variation within and among populations over 5 years
Jeffrey W. Ashmun, Robert L. Brown, and Louis F. Pitelka 2035

Plocher, M.
Growth response of two varieties of slash pine seedlings to chronic ozone exposures
W.E. Hogsett, M. Plocher, V. Wildman, D.T. Tingey, and J.P. Bennett 2369

Ploetz, R.C.
Influence of water potential on the survival and saprophytic activity of *Rhizoctonia solani* AG 4 in natural soil
R.C. Ploetz and D.J. Mitchell 2364

Plowright, R.C.
The effects of nectar level and flower development on pollen carry-over in inflorescences of fireweed (*Epilobium angustifolium*) (Onagraceae)
C. Galen and R.C. Plowright 488

Matacil insecticide spraying, pollinator mortality, and plant fecundity in New Brunswick forests
James D. Thomson, R.C. Plowright, and G.R. Thaler 2056

Pollack, J.C.
Monoterpene and morphological variation and hybridization of *Pinus contorta* and *P. banksiana* in Alberta
John C. Pollack and Bruce P. Dancik 201

Polowick, P.L.
Fruit development in tomato: the role of temperature
V.K. Sawhney and P.L. Polowick 1031

Microsporogenesis and gametophyte maturation in cultured tassels of *Zea mays*
P.L. Polowick and R.I. Greyson 2196

Posluszny, U.
The reproductive biology of *Hydrocharis morsus-ranae*. II. Seed and seedling morphology
Robin W. Scribailo and Usher Posluszny 492

Potvin, C.
Photosynthetic response to growth temperature and CO_2 enrichment in two species of C_4 grasses
Catherine Potvin and Boyd R. Strain 483

Effects of CO_2 enrichment and temperature on growth in two C_4 weeds, *Echinochloa crus-galli* and *Eleusine indica*
Catherine Potvin and Boyd R. Strain 1495

Powell, G.R.
First growing period development of *Acer saccharum* stump sprouts arising after different dates of cut
Joanne E. MacDonald and G.R. Powell 819

Crown architecture of *Larix laricina* saplings: sylleptic branching on the main stem
W.R. Remphrey and G.R. Powell 1296

Pregitzer, K.S.
Occurrence of hybrids between bigtooth and trembling aspen in Michigan
Burton V. Barnes and Kurt S. Pregitzer 1888

Prescott, C.E.
Effects of sulphur pollution on rates of litter decomposition in a pine forest
Cindy E. Prescott and Dennis Parkinson 1436

Proctor, J.T.A.
Effects of cotyledon removal on apple seedling growth and distribution of ^{14}C-labelled photosynthates
Jia-Rui Li, J.T.A. Proctor, and D.P. Murr 1736

Puckett, K.J.
Uptake of gaseous sulphur dioxide by the lichen *Cladina rangiferina*
B. Grace, T.J. Gillespie, and K.J. Puckett 797

Sulphur dioxide threshold concentration values for *Cladina rangiferina* in the Mackenzie Valley, N.W.T.
B. Grace, T.J. Gillespie, and K.J. Puckett 806

Pueschel, C.M.
Petersenia palmariae n. sp. (Oomycetes): a pathogenic parasite of the red alga *Palmaria mollis* (Rhodophyceae)
John P. van der Meer and Curt M. Pueschel 404

Ultrastructure of the fungus *Petersenia palmariae* (Oomycetes) parasitic on the alga *Palmaria mollis* (Rhodophyceae)
C.M. Pueschel and J.P. van der Meer 409

Puhalla, J.E.
Classification of strains of *Fusarium oxysporum* on the basis of vegetative compatibility
John E. Puhalla 179

Rabau, T.
Développement floral chez *Eragrotis tef*: dynamique des gamétophytogenèses
B. Longly, T. Rabau et B.P. Louant 1900

Rai, B.
A new species of *Parapyricularia* from India
B. Rai and Kamal 988

Raju, M.V.S.
Radial elongation of the epidermal cells of scutellum during caryopsis germination of wild oats (*Avena fatua*)
D.V. Rao and M.V.S. Raju 1789

Floret anthesis and pollination in wild oats (*Avena fatua*)
M.V.S. Raju, G.J. Jones, and G.F. Ledingham 2187

Randall, D.L.
The distribution of *Xyris difformis* along a gradient of exposure to waves: an experimental study
Scott D. Wilson, Paul A. Keddy, and Deborah L. Randall 1226

Ransom, J.S.
Geoperception in primary and lateral roots of *Phaseolus vulgaris* (Fabaceae). III. A model to explain the differential georesponsiveness of primary and lateral roots
J. Steven Ransom and Randy Moore 21

Rao, A.S.
Toxicity of soil-applied fungicides and gypsum to the vesicular–arbuscular mycorrhizal fungus *Glomus mosseae* in groundnut
K. Parvathi, K. Venkateswarlu, and A.S. Rao 1673

Rao, D.V.
Radial elongation of the epidermal cells of scutellum during caryopsis germination of wild oats (*Avena fatua*)
D.V. Rao and M.V.S. Raju 1789

Rao, G.S.R.L.
Suberization of tomato (*Lycopersicon esculentum*) locule tissue
Gonella S.R.L. Rao, J.H. Martin Willison, and W.M. Nimal Ratnayake 2177

Rao, K.N.
A new species of *Kuehneola* on *Gymnosporia montana* from India
G. Bagyanarayana and K. Niranjan Rao 762

Ratnayake, W.M.N.
Suberization of tomato (*Lycopersicon esculentum*) locule tissue
Gonella S.R.L. Rao, J.H. Martin Willison, and W.M. Nimal Ratnayake 2177

Rauser, W.E.
Evaluation of copper, nickel, and zinc tolerances in four grass species
Wilfried E. Rauser and E. Keith Winterhalder 58

Read, N.D.
The anatomy of the mature perithecium in *Sordaria humana* and its significance for fungal multicellular development
N.D. Read and A. Beckett 281

Reader, R.J.
Reproductive schedule of *Medicago lupulina* (Leguminosae) in a patchy environment
L.V. Pavone and R.J. Reader 2044

Redhead, S.A.
Mycopappus, a new genus of leaf pathogens, and two parasitic *Anguillospora* species
S.A. Redhead and G.P. White 1429

Redmann, R.E.
A simple technique for making epidermal imprints using clear vinyl film
R.E. Redmann 1669

Reich, P.B.
Effects of O_3, SO_2, and acidic rain on mycorrhizal infection in northern red oak seedlings
P.B. Reich, A.W. Schoettle, H.F. Stroo, J. Troiano, and R.G. Amundson 2049

Reinke, D.C.
The species-specific effects of sublethal concentrations of cadmium on freshwater phytoplankton communities in a Canadian Shield lake
Danny C. Reinke and Frank deNoyelles, Jr. 1997

Rembur, J.
Des variations d'activités de la 5'-nucléotidase et de l'adénylatecyclase sont-elles des composantes de la levée d'inhibition du bourgeon cotylédonaire du pois?
Arlette Nougarède, Pierre Landré, Jacques Rembur et Mercedes Niebla Hernandez 309

Remphrey, W.R.
Crown architecture of *Larix laricina* saplings: sylleptic branching on the main stem
W.R. Remphrey and G.R. Powell 1296

Renaudin, S.
Localisation ultrastructurale de la phosphoénolpyruvate carboxylase dans la feuille de maïs par immunocytochimie
L. Rey, P. Thalouarn, J. Vidal et S. Renaudin 1696

Rey, L.
Localisation ultrastructurale de la phosphoénolpyruvate carboxylase dans la feuille dc maïs par immunocytochimie
L. Rey, P. Thalouarn, J. Vidal et S. Renaudin 1696

Rhodes, M.J.C.
Mucilaginous film production by plant cells immobilised in a polyurethane or nylon matrix
M.J.C. Rhodes, R.J. Robins, R.J. Turner, and J.I. Smith 2357

Ribéreau-Gayon, P.
Dégradation de l'acide malique par *Botrytis cinerea*
Bernard Donèche, Françoise Roux et Pascal Ribéreau-Gayon 1820

Richardson, C.J.
Forty-one years of population change and community succession in aspen forests on four soil types, northern lower Michigan, U.S.A.
Mark R. Roberts and Curtis J. Richardson 1641

Richardson, D.H.S.
Uranium accumulation in the lichen *Cladonia rangiferina*. Part I. Uptake of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. Boileau, E. Nieboer, and D.H.S. Richardson 384

Uranium accumulation in the lichen *Cladonia rangiferina*. Part II. Toxic effects of cationic, neutral, and anionic forms of the uranyl ion
L.J.R. Boileau, E. Nieboer, and D.H.S. Richardson 390

Roberts, M.R.
Forty-one years of population change and community succession in aspen forests on four soil types, northern lower Michigan, U.S.A.
Mark R. Roberts and Curtis J. Richardson 1641

Robertson, B.L.
Megagametophyte development in *Hordeum vulgare*. 1. Early megagametogenesis and the nature of cell wall formation
D.D. Cass, D.J. Peteya, and B.L. Robertson 2164

Robertson, D.C.
Ultrastructural aspects of *Pyrola* mycorrhizae
Diane C. Robertson and Jack A. Robertson 1089

Robertson, J.A.
Ultrastructural aspects of *Pyrola* mycorrhizae
Diane C. Robertson and Jack A. Robertson 1089

Robins, R.J.
Mucilaginous film production by plant cells immobilised in a polyurethane or nylon matrix
M.J.C. Rhodes, R.J. Robins, R.J. Turner, and J.I. Smith 2357

Robinson, G.G.C.
Seasonal succession of diatom epiphyton on dense mats of *Lemna minor*
L.G. Goldsborough and G.G.C. Robinson 2332

Robinson, S.J.
Triploidy and its evolutionary significance in *Cystopteris protrusa*
CHRISTOPHER H. HAUFLER, MICHAEL D. WINDHAM, DONALD M. BRITTON, and SCOTT J. ROBINSON **1855**

Rohr, R.
Micropropagation de l'érable par bouturage *in vitro* de fragments de germinations de trois espèces
DOMINIQUE HANUS et RENÉ ROHR **277**

Rohringer, R.
Cytochemical studies on *Puccinia graminis* f. sp. *tritici* in a compatible wheat host. I. Walls of intercellular hyphal cells and haustorium mother cells
J. CHONG, D.E. HARDER, and R. ROHRINGER **1713**

Comparative analysis of proteins of *Uromyces phaseoli* var. *typica*, *U. phaseoli* var. *vignae*, and *U. viciae-fabae*: polypeptide mapping by two-dimensional electrophoresis
W.K. KIM, MICHÈLE C. HEATH, and R. ROHRINGER **2144**

Roland, W.G.
Effects of lamina harvest on the bull kelp, *Nereocystis luetkeana*
WILLIAM G. ROLAND **333**

Rollo, C.D.
Electrophoretic and allometric variation in burdock (*Arctium* spp.): hybridization and its ecological implications
C. DAVID ROLLO, J.D. MACFARLANE, and B.S. SMITH **1255**

Roux, F.
Dégradation de l'acide malique par *Botrytis cinerea*
BERNARD DONÈCHE, FRANÇOISE ROUX et PASCAL RIBÉREAU-GAYON **1820**

Russin, J.S.
Disseminative fitness of *Endothia parasitica* containing different agents for cytoplasmic hypovirulence
J.S. RUSSIN and L. SHAIN **54**

Rutherford, F.S.
Evidence for genetic control of oospore abortion in *Phytophthora megasperma* f. sp. *glycinea*
F.S. RUTHERFORD and E.W.B. WARD **1671**

Rutin, J.
Formation de globoïdes et de cristaux au cours de l'embryogenèse de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **1914**

Distribution de quelques oligo-éléments dans des cristaux de graines de *Raphanus*
LOUIS GENEVÈS, JACQUES RUTIN et SYLVAIN HALPERN **2399**

Saccomani, M.
Nitrogen absorption and assimilation in NaCl-resistant and NaCl-susceptible millet genotypes (*Pennisetum americanum*)
ALESSANDRA BOTTACIN, GIOVANNI CACCO, and MASSIMO SACCOMANI **517**

Sackston, W.E.
Early stages of infection of resistant and susceptible sunflower seedlings by three races of *Plasmopara halstedii*
A. BRUCE GRAY and W.E. SACKSTON **1725**

The development of infection structures of *Plasmopara halstedii* in suspensions of sunflower cells
A. BRUCE GRAY, W.E. SACKSTON, and LOUIS THAUVETTE **1817**

Saikawa, M.
Electron microscopy on a nematode-trapping fungus, *Acaulopage pectospora*
MASATOSHI SAIKAWA and CHIHARU MORIKAWA **1386**

Electron microscopy of an endoparasitic fungus, *Gonimochaete pyriforme*, infecting nematodes
MASATOSHI SAIKAWA and TAKASHI ANAZAWA **2326**

Sakai, A.
Types of Florin rings, distributional patterns of epicuticular wax, and their relationships in the genus *Pinus*
FUMIO YOSHIE and AKIRA SAKAI **2150**

Sanglier, J.J.
Optimisation de la croissance et de la sporulation de *Conidiobolus obscurus* en milieu défini
J.P. LATGÉ et J.J. SANGLIER **68**

Sawhney, V.K.
Fruit development in tomato: the role of temperature
V.K. SAWHNEY and P.L. POLOWICK **1031**

Periclinal and oblique divisions in the surface layer of the shoot apex of tomato (*Lycopersicon esculentum*)
V.K. SAWHNEY and K.N. CHANDRA SEKHAR **1564**

Scagel, R.K.
Assessing sample size and variable number in multivariate data, with specific reference to cone morphology variation in a population of *Picea sitchensis*
ROB SCAGEL, Y.A. EL-KASSABY, and J. EMANUEL **232**

Quantitative studies in early ovule development. I. Intraindividual variation in *Nothofagus antarctica*
R.K. SCAGEL, J. MAZE, L.R. BOHM, and N.L. VOGT **1769**

Schatt, E.
État nucléaire des méristèmes du pois dans la graine sèche; imbibition et reprise du cycle cellulaire
E. SCHATT, P. LANDRÉ et A. NOUGARÈDE **2200**

Schiavone, F.M.
A geometric analysis of somatic embryo formation in carrot cell cultures
F. MARK SCHIAVONE and TODD J. COOKE **1573**

Schloesser, D.W.
Growth of submersed macrophyte communities in the St. Clair – Detroit river system between Lake Huron and Lake Erie
DONALD W. SCHLOESSER, THOMAS A. EDSALL, and BRUCE A. MANNY **1061**

Schmidt, E.L.
Aliphatic acids as spore germination inhibitors of wood-decay fungi *in vitro*
ELMER L. SCHMIDT **337**

Schnekenburger, F.
Reproductive characteristics of green alder in northwestern Ontario
R.E. FARMER, JR., M.L. MALEY, M.U. STOEHR, and F. SCHNEKENBURGER **2243**

Schoettle, A.W.
Effects of O_3, SO_2, and acidic rain on mycorrhizal infection in northern red oak seedlings
P.B. REICH, A.W. SCHOETTLE, H.F. STROO, J. TROIANO, and R.G. AMUNDSON **2049**

Schoknecht, J.D.
A Costa Rican black mildew found in Everglades National Park, Florida
M.L. FARR, JEAN D. SCHOKNECHT, and J.L. CRANE **1983**

Schulman, H.M.
Nitrogen fixation in the high arctic tundra at Sarcpa Lake, Northwest Territories
JIM D. KARAGATZIDES, MARTIN C. LEWIS, and HERBERT M. SCHULMAN **974**

Schumacher, T.
A monographic revision of the genus *Myriosclerotinia*
TROND SCHUMACHER and LINDA M. KOHN **1610**

Schwartz, O.A.
Lack of protein polymorphism in the endemic relict *Chrysosplenium iowense* (Saxifragaceae)
ORLANDO A. SCHWARTZ **2031**

Scribailo, R.W.
The reproductive biology of *Hydrocharis morsus-ranae*. II. Seed and seedling morphology
ROBIN W. SCRIBAILO and USHER POSLUSZNY **492**

Scrubb, L.
Effect of heat shock on protein synthesis in flax rust uredosporelings
MICHAEL SHAW, ROSALINDA BOASSON, and LEROY SCRUBB **2069**

Seeni, S.
The isolation and cultivation of protoplasts from cell suspensions of a pantothenate-requiring auxotroph of *Datura*
M. Mii, S. Seeni, L.C. Fowke, and J. King 779

Seibles, T.S.
Production of extracellular enzymes by germinating cysts of *Phytophthora infestans*
Robert A. Moreau and Thomas S. Seibles 1811

Seip, D.R.
Species composition and herbage production of mountain rangelands in northern British Columbia
Dale R. Seip and Fred L. Bunnell 2077

Sekhar, K.N.C.
Periclinal and oblique divisions in the surface layer of the shoot apex of tomato (*Lycopersicon esculentum*)
V.K. Sawhney and K.N. Chandra Sekhar 1564

Seliskar, D.M.
Effect of reciprocal transplanting between extremes of plant zones on morphometric plasticity of five plant species in an Oregon salt marsh
Denise M. Seliskar 2254

Semple, J.C.
Cytogeographic studies on North American asters. II. *Virgulus ericoides* and *V. novae-angliae* in southern Ontario
Jerry G. Chmielewski and John C. Semple 1652

Sérodes, J.-B.
The influence of salinity on *Scirpus americanus* tidal marshes in the St. Lawrence River estuary, Québec
J. Deschênes and J.-B. Sérodes 920

Shain, L.
Disseminative fitness of *Endothia parasitica* containing different agents for cytoplasmic hypovirulence
J.S. Russin and L. Shain 54

Sharik, T.L.
The avian seed dispersal system of eastern red cedar (*Juniperus virginiana*)
Anthonie M.A. Holthuijzen and Terry L. Sharik 1508

Sharma, M.P.
Effect of aqueous leachates from polyvinyl chloride on seed germination and growth of various crop species
M.P. Sharma 1072

Sharp, M.J.
Biomass accumulation by *Rhexia virginica* and *Triadenum fraseri* along two lakeshore gradients: a field experiment
Mirek J. Sharp and Paul A. Keddy 1806

Shaver, G.R.
A multivariate approach to plant mineral nutrition: dose–response relationships and nutrient dominance in factorial experiments
G.R. Shaver and M.J. Lechowicz 2138

Shaw, M.
The effects of CO_2 and membranes on sporulation in axenic cultures of flax rust
Rosalinda Boasson and Michael Shaw 1418

Effect of heat shock on protein synthesis in flax rust uredosporelings
Michael Shaw, Rosalinda Boasson, and Leroy Scrubb 2069

Shay, J.M.
The effects of fire on *Phragmites australis* in the Delta Marsh, Manitoba
D.J. Thompson and J.M. Shay 1864

Shelp, B.J.
Determination of urea and ammonia in leaf extracts: application to ureide metabolism
Barry J. Shelp, Konrad Sieciechowicz, Robert J. Ireland, and Kenneth W. Joy 1135

Inorganic carbon accumulation and photosynthesis by *Chlorella pyrenoidosa*
Barry J. Shelp and David T. Canvin 1249

Shigo, A.L.
How tree branches are attached to trunks
Alex L. Shigo 1391

Shih, C.Y.
Developmental studies of the stratification–germination process in sugar maple embryos
C.Y. Shih, E.B. Dumbroff, and Carol A. Peterson 903

Shoemaker, R.A.
Canadian and some extralimital *Paraphaeosphaeria* species
R.A. Shoemaker and C.E. Babcock 1284

Sidhu, G.S.
Characteristics and natural occurrence of *Gibberella fujikuroi* mating groups A and D on sorghum and corn hosts
Gurmel S. Sidhu 562

Sieciechowicz, K.
Determination of urea and ammonia in leaf extracts: application to ureide metabolism
Barry J. Shelp, Konrad Sieciechowicz, Robert J. Ireland, and Kenneth W. Joy 1135

Singh, R.
Concentration, standing state, and cycling of nitrogen in soil–vegetation components of sand and dune herbaceous vegetation around Pilani, Rajasthan, India
Room Singh and M.C. Joshi 2350

Small, E.
Medicago lesinsii, a new Mediterranean species
Ernest Small and Brenda S. Brookes 728

Morphological differentiation in *Medicago sativa* s.l. in relation to ploidy
Ernest Small 1747

Smart, M.G.
Chlortetracycline and barley papilla formation: localization of calcium and alteration of the response induced by *Erysiphe graminis*
M.R. Marshall, M.G. Smart, J.R. Aist, and H.W. Israel 876

Smith, B.S.
Electrophoretic and allometric variation in burdock (*Arctium* spp.): hybridization and its ecological implications
C. David Rollo, J.D. MacFarlane, and B.S. Smith 1255

Smith, J.I.
Mucilaginous film production by plant cells immobilised in a polyurethane or nylon matrix
M.J.C. Rhodes, R.J. Robins, R.J. Turner, and J.I. Smith 2357

Smith, L.M.
The effects of disturbance on marsh seed banks
Loren M. Smith and John A. Kadlec 2133

Smith, W.B.
Evaluating allometric shrub biomass equations fit to generated data
Gary J. Brand and W. Brad Smith 64

Snyder, W.C.
An aggressive vascular-inhabiting *Phoma* (*Phoma tracheiphila* f. sp. *chrysanthemi* nov. f. sp.) weakly pathogenic to chrysanthemum
Kenneth F. Baker, Lily H. Davis, Stephen Wilhelm, and William C. Snyder 1730

Söderström, B.
Soil microfungi in an area polluted by heavy metals
Anders Nordgren, Erland Bååth, and Bengt Söderström 448

Soltis, D.E.
Chromosomal and flavonoid chemical confirmation of intergeneric hybridization between *Tolmiea* and *Tellima* (Saxifragaceae)
Douglas E. Soltis and Bruce A. Bohm 1309

Sorensen, E.L.
Stigma development and the stigmatic cuticle of *Medicago scutellata*
G.L. Kreitner and E.L. Sorensen 813

Soto, C.
Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VI. Phosphate uptake and retention
T.C. HUTCHINSON, C. SOTO, and J.A. HELLEBUST **829**

Effect of naphthalene and aqueous crude-oil extracts on the green flagellate *Chlamydomonas angulosa*. VII. Nitrate and methylamine uptake and retention
J.A. HELLEBUST, C. SOTO, and T.C. HUTCHINSON **834**

Soulie, M.-C.
Interactions hôte–parasite lors de l'infection par *Cercosporella herpotrichoides*, agent du piétin-verse: morphologie du parasite et ultrastructure des parois d'hôtes sensibles et résistants
MARIE-CHRISTINE SOULIE, BRIGITTE VIAN et THÉRÈSE GUILLOT-SALOMON **851**

Spielman, L.J.
A monograph of *Valsa* on hardwoods in North America
LINDA J. SPIELMAN **1355**

Sqalli, M.
Divisions cellulaires au niveau de l'épiderme de l'hypocotyle du lin (*Linum usitatissimum*) cultivé *in vitro*
M. SQALLI et H. CHLYAH **1691**

Staniforth, R.J.
Factors determining the distribution of *Opuntia fragilis* in the boreal forest of southeastern Manitoba
K.A. FREGO and R.J. STANIFORTH **2377**

Stenlid, J.
Population structure of *Heterobasidion annosum* as determined by somatic incompatibility, sexual incompatibility, and isoenzyme patterns
JAN STENLID **2268**

Stewart, D.W.
Water stress conditioning of corn (*Zea mays*) in the field and the greenhouse
L.M. DWYER and D.W. STEWART **704**

Stieber, J.
Wave nature and a theory of cambial activity
JOSEPH STIEBER **1942**

Stinson, R.H.
Phase properties of membranes after freezing injury in winter wheat
EDWARD J. KENDALL, BRYAN D. MCKERSIE, and ROBERT H. STINSON **2274**

Stockey, R.A.
Growth and reproductive biology of *Joffrea speirsii* gen. et sp. nov., a *Cercidiphyllum*-like plant from the Late Paleocene of Alberta, Canada
PETER R. CRANE and RUTH A. STOCKEY **340**

Stoehr, M.U.
Reproductive characteristics of green alder in northwestern Ontario
R.E. FARMER, JR., M.L. MALEY, M.U. STOEHR, and F. SCHNEKENBURGER **2243**

Strain, B.R.
Photosynthetic response to growth temperature and CO_2 enrichment in two species of C_4 grasses
CATHERINE POTVIN and BOYD R. STRAIN **483**

Effects of CO_2 enrichment and temperature on growth in two C_4 weeds, *Echinochloa crus-galli* and *Eleusine indica*
CATHERINE POTVIN and BOYD R. STRAIN **1495**

Stratton, L.J.
Erratum: Effects of a simulated acidic, metal-containing precipitation on coniferous litter decomposition
KIRK A. MOLONEY, LORI J. STRATTON, and RICHARD M. KLEIN **2081**

Stroo, H.F.
Effects of O_3, SO_2, and acidic rain on mycorrhizal infection in northern red oak seedlings
P.B. REICH, A.W. SCHOETTLE, H.F. STROO, J. TROIANO, and R.G. AMUNDSON **2049**

Svoboda, J.
The latitudinal inventory of ^{137}Cs in vegetation and topsoil in northern Canada, 1980
E. HUTCHISON-BENSON, J. SVOBODA, and H.W. TAYLOR **784**

Search for latitudinal trends in the effective half-life of fallout ^{137}Cs in vegetation of the Canadian Arctic
H.W. TAYLOR, E. HUTCHISON-BENSON, and J. SVOBODA **792**

Ta, T.C.
Transamination, deamidation, and the utilisation of asparagine amino nitrogen in pea leaves
TRUNG CHANH TA and KENNETH W. JOY **881**

Tajimi, A.
Field survival of sclerotia of *Typhula incarnata* and of *T. ishikariensis* biotype A
N. MATSUMOTO and A. TAJIMI **1126**

Tanino, K.K.
Injury within the crown of winter wheat seedlings after freezing and icing stress
KAREN K. TANINO and BRYAN D. MCKERSIE **432**

Tavantzis, S.M.
Evaluation of the presence of double-stranded RNA in *Ceratocystis ulmi*
J.G. HOCH, S.M. TAVANTZIS, R.J. CAMPANA, and S.L. ANAGNOSTAKIS **297**

Taylor, G.J.
Differential uptake and toxicity of ionic and chelated copper in *Triticum aestivum*
GREGORY J. TAYLOR and CHARLES D. FOY **1271**

Mechanisms of aluminum tolerance in *Triticum aestivum* (wheat). IV. The role of ammonium and nitrate nutrition
GREGORY J. TAYLOR and CHARLES D. FOY **2181**

Taylor, G.S.
A light microscope study of resistant and susceptible carnations infected with *Fusarium oxysporum* f.sp. *dianthi*
R. HARLING and G.S. TAYLOR **638**

Taylor, H.W.
The latitudinal inventory of ^{137}Cs in vegetation and topsoil in northern Canada, 1980
E. HUTCHISON-BENSON, J. SVOBODA, and H.W. TAYLOR **784**

Search for latitudinal trends in the effective half-life of fallout ^{137}Cs in vegetation of the Canadian Arctic
H.W. TAYLOR, E. HUTCHISON-BENSON, and J. SVOBODA **792**

Thaler, G.R.
Matacil insecticide spraying, pollinator mortality, and plant fecundity in New Brunswick forests
JAMES D. THOMSON, R.C. PLOWRIGHT, and G.R. THALER **2056**

Thalouarn, P.
Localisation ultrastructurale de la phosphoénolpyruvate carboxylase dans la feuille de maïs par immunocytochimie
L. REY, P. THALOUARN, J. VIDAL et S. RENAUDIN **1696**

Thauvette, L.
The development of infection structures of *Plasmopara halstedii* in suspensions of sunflower cells
A. BRUCE GRAY, W.E. SACKSTON, and LOUIS THAUVETTE **1817**

Thiébaut, B.
Architecture des jeunes hêtres *Fagus sylvatica*
B. THIÉBAUT, J. CUGUEN et S. DUPRÉ **2100**

Thomas, P.A.
Water availability and the comparative emergence of four conifer species
P.A. THOMAS and ROSS W. WEIN **1740**

Thompson, D.J.
The effects of fire on *Phragmites australis* in the Delta Marsh, Manitoba
D.J. THOMPSON and J.M. SHAY **1864**

Thomson, J.D.
Matacil insecticide spraying, pollinator mortality, and plant fecundity in New Brunswick forests
JAMES D. THOMSON, R.C. PLOWRIGHT, and G.R. THALER **2056**

Thorn, R.G.
The occurrence of ectomycorrhizae in some species of Cistaceae in North America
DAVID MALLOCH and R. GREG THORN **872**

Thorpe, T.A.
Origin of adventitious shoots in excised radiata pine cotyledons cultured *in vitro*
VICTOR M. VILLALOBOS, EDWARD C. YEUNG, and TREVOR A. THORPE **2172**

Tingey, D.T.
Growth response of two varieties of slash pine seedlings to chronic ozone exposures
W.E. HOGSETT, M. PLOCHER, V. WILDMAN, D.T. TINGEY, and J.P. BENNETT **2369**

Torossian, K.
Are charged lipid-linked intermediates involved in the biosynthesis of β-glucans?
ANNE CAMIRAND, KRIKOR TOROSSIAN, TAKAHISA HAYASHI, and GORDON MACLACHLAN **867**

Torrey, J.G.
Early development of *Rhizobium*-induced root nodules of *Parasponia rigida*. II. Nodule morphogenesis and symbiotic development
SUSAN A. LANCELLE and JOHN G. TORREY **25**

Tranvan, H.
Greffage *in vitro* du pin maritime (*Pinus pinaster*)
H. TRANVAN et A. DAVID **1017**

Traquair, J.A.
Sclerotia of *Aspergillus aculeatus*
W.R. JARVIS and J.A. TRAQUAIR **1567**

Tredick, J.
DNA relatedness among species of *Geotrichum* and *Dipodascus*
EVELINE GUÉHO, JOANNE TREDICK, and HERMAN J. PHAFF **961**

Tremblay, F.M.
Nodulation speed of *Frankia* sp. on *Alnus glutinosa*, *Alnus crispa*, and *Myrica gale*
XAVIER NESME, PHILIPPE NORMAND, FRANCINE M. TREMBLAY, and MAURICE LALONDE **1292**

Troiano, J.
Effects of O_3, SO_2, and acidic rain on mycorrhizal infection in northern red oak seedlings
P.B. REICH, A.W. SCHOETTLE, H.F. STROO, J. TROIANO, and R.G. AMUNDSON **2049**

Trouvelot, A.
Evaluation of the infectivity and effectiveness of indigenous vesicular–arbuscular fungal populations in some agricultural soils in Burgundy
V. GIANINAZZI-PEARSON, S. GIANINAZZI, and A. TROUVELOT **1521**

Tsai, D.
Breeding systems and genetic variation in *Amsinckia spectabilis* (Boraginaceae)
FRED R. GANDERS, SUSAN K. DENNY, and DAVID TSAI **533**

Turkington, R.
Competitive relations among species from pastures of different ages
L.W. AARSSEN and ROY TURKINGTON **2319**

Turner, R.J.
Mucilaginous film production by plant cells immobilised in a polyurethane or nylon matrix
M.J.C. RHODES, R.J. ROBINS, R.J. TURNER, and J.I. SMITH **2357**

Turpin, D.H.
A culture system enabling *in situ* determination of net and gross photosynthesis, O_2 evolution, N assimilation, and C_2H_2 reduction in cyanobacteria
DAVID H. TURPIN and DAVID B. LAYZELL **1025**

Untiedt, E.
Colonization of *Sphagnum* cells by *Lyophyllum palustre*
E. UNTIEDT and K. MÜLLER **757**

Vallade, J.
Croissance des coenocytes provasculaires dans la racine de *Marsilea diffusa* (Marsiléales)
JEAN VALLADE et JOSIANE ALABOUVETTE **301**

van der Meer, J.P.
Palmaria mollis stat. nov.: a newly recognized species of *Palmaria* (Rhodophyceae) from the northeast Pacific Ocean
JOHN P. VAN DER MEER and CAROLYN J. BIRD **398**

Petersenia palmariae n. sp. (Oomycetes): a pathogenic parasite of the red alga *Palmaria mollis* (Rhodophyceae)
JOHN P. VAN DER MEER and CURT M. PUESCHEL **404**

Ultrastructure of the fungus *Petersenia palmariae* (Oomycetes) parasitic on the alga *Palmaria mollis* (Rhodophyceae)
C.M. PUESCHEL and J.P. VAN DER MEER **409**

van der Poorten, G.
Carbon dioxide exchange rates and leaf nitrogen contents during ageing of the flag and penultimate leaves of five spring-wheat cultivars
L.A. HUNT and G. VAN DER POORTEN **1605**

van Huystee, R.B.
Chilling-induced chlorosis in maize (*Zea mays*)
R. HODGINS and R.B. VAN HUYSTEE **711**

Light microscopic and polypeptide analyses of sclerotia from mesophilic and psychrophilic pathogenic fungi
JAMES P. INSELL, N.P.A. HUNER, W. JAY NEWSTED, and R.B. VAN HUYSTEE **2305**

The effects of temperature on the growth and polypeptide composition of several snow mold species
W.J. NEWSTED, N.P.A. HUNER, J.P. INSELL, M. GRIFFITH, and R.B. VAN HUYSTEE **2311**

Venkateswarlu, K.
Toxicity of soil-applied fungicides and gypsum to the vesicular–arbuscular mycorrhizal fungus *Glomus mosseae* in groundnut
K. PARVATHI, K. VENKATESWARLU, and A.S. RAO **1673**

Vian, B.
Interactions hôte–parasite lors de l'infection par *Cercosporella herpotrichoides*, agent du piétin-verse: morphologie du parasite et ultrastructure des parois d'hôtes sensibles et résistants
MARIE-CHRISTINE SOULIE, BRIGITTE VIAN et THÉRÈSE GUILLOT-SALOMON **851**

Vicente, C.
Effect of an exogenous supply of urea on the content and secretion of soluble carbohydrates of *Evernia prunastri*
C. VICENTE and MARIA JOSÉ BLANCO **1344**

Phytochrome enhances nitrate reductase activity in the lichen *Evernia prunastri*
A. AVALOS and C. VICENTE **1350**

Vidal, G.
Évolution de la teneur en lipides de *Leptosphaeria typhae* en fonction de sa croissance et de sa reproduction sexuée: activité de synthèse et étude des lipides neutres et polaires
GÉRARD VIDAL **2460**

Vidal, J.
Localisation ultrastructurale de la phosphoénolpyruvate carboxylase dans la feuille de maïs par immunocytochimie
L. REY, P. THALOUARN, J. VIDAL et S. RENAUDIN **1696**

Vieth, J.
Développement du fruit de *Prunus virginiana* (Rosaceae)
MICHEL LABRECQUE, DENIS BARABÉ et JOACHIM VIETH **242**

Histogenèse et organogenèse de *Picea pungens* cultivé *in vitro*
LOUISE CHRÉTIEN et JOACHIM VIETH **1313**

Villalobos, V.M.
Origin of adventitious shoots in excised radiata pine cotyledons cultured *in vitro*
VICTOR M. VILLALOBOS, EDWARD C. YEUNG, and TREVOR A. THORPE **2172**

Vogt, N.L.
Quantitative studies in early ovule development. I. Intraindividual variation in *Nothofagus antarctica*
R.K. SCAGEL, J. MAZE, L.R. BOHM, and N.L. VOGT **1769**

von Aderkas, P.
In vitro development of isolated leaf primordia of *Matteuccia struthiopteris*
P. VON ADERKAS and G. HICKS **916**

Walckowiak, A.M.
Host infection and flower formation by the parasite *Tristerix aphyllus* (Loranthaceae)
JAMES D. MAUSETH, GLORIA MONTENEGRO, and ALAN M. WALCKOWIAK **567**

Walker, D.B.
Incompetence of stem epidermal cells to dedifferentiate and graft
DAN B. WALKER and DAVID K. BRUCK **2129**

Ward, E.W.B.
Evidence for genetic control of oospore abortion in *Phytophthora megasperma* f. sp. *glycinea*
F.S. RUTHERFORD and E.W.B. WARD **1671**

Warwick, S.I.
Variation and climatic adaptation in northern populations of *Datura stramonium*
SUSAN E. WEAVER, VICTOR A. DIRKS, and SUZANNE I. WARWICK **1303**

Weaver, S.E.
Variation and climatic adaptation in northern populations of *Datura stramonium*
SUSAN E. WEAVER, VICTOR A. DIRKS, and SUZANNE I. WARWICK **1303**

Webb, D.P.
Physiological responses of three northern conifers to rapid and slow induction of moisture stress
G.F. BUXTON, D.R. CYR, E.B. DUMBROFF, and D.P. WEBB **1171**

Wehr, J.D.
Physiological ecology of the bloom-forming alga *Chrysochromulina breviturrita* (Prymnesiophyceae) from lakes influenced by acid precipitation
JOHN D. WEHR, LEWIS M. BROWN, and KATHRYN O'GRADY **2231**

Wein, R.W.
Water availability and the comparative emergence of four conifer species
P.A. THOMAS and ROSS W. WEIN **1740**

Westelaken, I.L.
Spatial pattern and seed dispersal of *Lithospermum caroliniense* on Lake Huron sand dunes
IRENE L. WESTELAKEN and M.A. MAUN **125**

Whitaker, R.J.
Glyphosate as a probe of the pentafunctional *arom* protein of *Euglena gracilis*
GRAHAM S. BYNG, ROBERT J. WHITAKER, and ROY A. JENSEN **1021**

White, G.P.
A new *Morrisographium*-like species with appendaged conidia assigned to the genus *Conicomyces*
WM.I. ILLMAN and GEORGE P. WHITE **419**

The dark synnematous hyphomycete genus *Morrisographium:* described species transferred from *Sphaeronaema, Cornularia, Phragmographium,* and *Arthrobotryum*
WM.I. ILLMAN and GEORGE P. WHITE **423**

Mycopappus, a new genus of leaf pathogens, and two parasitic *Anguillospora* species
S.A. REDHEAD and G.P. WHITE **1429**

Whitecross, M.I.
Aphid-induced changes in growth indices of three leguminous plants: unrestricted infestation
C.D.B. HAWKINS, M.J. ASTON, and M.I. WHITECROSS **2454**

Wickens, L.K.
Salinity tolerance in *Spergularia marina*
JOHN M. CHEESEMAN, P. BLOEBAUM, CAROL ENKOJI, and LINDA K. WICKENS **1762**

Wikeem, B.M.
Range extensions of grassland species in southern interior British Columbia
BRIAN M. WIKEEM and REG F. NEWMAN **2240**

Wildman, V.
Growth response of two varieties of slash pine seedlings to chronic ozone exposures
W.E. HOGSETT, M. PLOCHER, V. WILDMAN, D.T. TINGEY, and J.P. BENNETT **2369**

Wilhelm, S.
An aggressive vascular-inhabiting *Phoma (Phoma tracheiphila* f. sp. *chrysanthemi* nov. f. sp.) weakly pathogenic to chrysanthemum
KENNETH F. BAKER, LILY H. DAVIS, STEPHEN WILHELM, and WILLIAM C. SNYDER **1730**

Williams, P.G.
Orchidaceous rhizoctonias in pot cultures of vesicular–arbuscular mycorrhizal fungi
P.G. WILLIAMS **1329**

Willison, J.H.M.
Suberization of tomato (*Lycopersicon esculentum*) locule tissue
GONELLA S.R.L. RAO, J.H. MARTIN WILLISON, and W.M. NIMAL RATNAYAKE **2177**

Wilson, B.F.
Longevity and persistence of alder west of the tree line on the Seward Peninsula, Alaska
BRAYTON F. WILSON, WILLIAM A. PATTERSON III, and JOHN F. O'KEEFE **1870**

Wilson, M.A.
The continuity of primary and secondary growth in *Cordyline terminalis* (Agavaceae)
DARLEEN A. DEMASON and MARK A. WILSON **1907**

Wilson, S.D.
The distribution of *Xyris difformis* along a gradient of exposure to waves: an experimental study
SCOTT D. WILSON, PAUL A. KEDDY, and DEBORAH L. RANDALL **1226**

The growth of *Drosera intermedia* in nutrient-rich habitats: the role of insectivory and interspecific competition
SCOTT D. WILSON **2468**

Windham, M.D.
Triploidy and its evolutionary significance in *Cystopteris protrusa*
CHRISTOPHER H. HAUFLER, MICHAEL D. WINDHAM, DONALD M. BRITTON, and SCOTT J. ROBINSON **1855**

Winterhalder, E.K.
Evaluation of copper, nickel, and zinc tolerances in four grass species
WILFRIED E. RAUSER and E. KEITH WINTERHALDER **58**

Wood, S.M.
A morphometric study of effective nodules induced by *Rhizobium loti* and *Bradyrhizobium* sp. *(Lotus)* on *Lotus pedunculatus*
SUSAN M. WOOD, DAVID B. LAYZELL, WILLIAM NEWCOMB, and CLIVE E. PANKHURST **43**

Woodard, P.
The effect of fire severity level on postfire recovery of hazel and raspberry in east-central Alberta
MARK JOHNSTON and PAUL WOODARD **672**

Woods, T.A.D.
Hormonema merioides n.sp., on Douglas-fir needles
A. FUNK, T.A.D. WOODS, and SARAH J. HOPKINSON **1579**

Wulff, R.D.
Germination of seeds of different sizes in *Hyptis suaveolens:* the response to irradiance and mixed red–far-red sources
RENATA D. WULFF **885**

Yeung, E.C.
Origin of adventitious shoots in excised radiata pine cotyledons cultured *in vitro*
VICTOR M. VILLALOBOS, EDWARD C. YEUNG, and TREVOR A. THORPE **2172**

Yoshie, F.
Types of Florin rings, distributional patterns of epicuticular wax, and their relationships in the genus *Pinus*
FUMIO YOSHIE and AKIRA SAKAI **2150**

You, R.
Ultrastructural observations of the mature megagametophyte and the fertilization in wheat (*Triticum aestivum*)
RUILIN YOU and WILLIAM A. JENSEN **163**

Young, D.R.
Crown architecture, light interception, and stomatal conductance patterns for sympatric deciduous and evergreen species in a forest understory
DONALD R. YOUNG **2425**

Young, J.L.
Endomycorrhizal colonization of glasshouse-grown wheat as influenced by fertilizer salts when banded or soil-mixed
E. ANNE DAVIS and J.L. YOUNG **1196**

Zagórska-Marek, B.
Phyllotactic patterns and transitions in *Abies balsamea*
BEATA ZAGÓRSKA-MAREK **1844**

Zeringue, H.J., Jr.
Specific cotton leaf responses to wounding and treatment with cell-free extracts of *Aspergillus flavus*
H.J. ZERINGUE, JR., E.J. CONKERTON, and D.C. CHAPITAL **2470**

Zobel, D.B.
Plant form, developmental plasticity, and survival following burial by volcanic tephra
JOSEPH A. ANTOS and DONALD B. ZOBEL **2083**

Upward movement of underground plant parts into deposits of tephra from Mount St. Helens
JOSEPH A. ANTOS and DONALD B. ZOBEL **2091**

Zoltai, S.C.
Development of a treed bog island in a minerotrophic fen
S.C. ZOLTAI and J.D. JOHNSON **1076**